Dec. 22, 1964 E. F. FRUME 3,162,328

DISPENSER FOR SEMI-INERT FLUID MATERIAL

Filed Feb. 28, 1961 4 Sheets-Sheet 1

Fig. 1

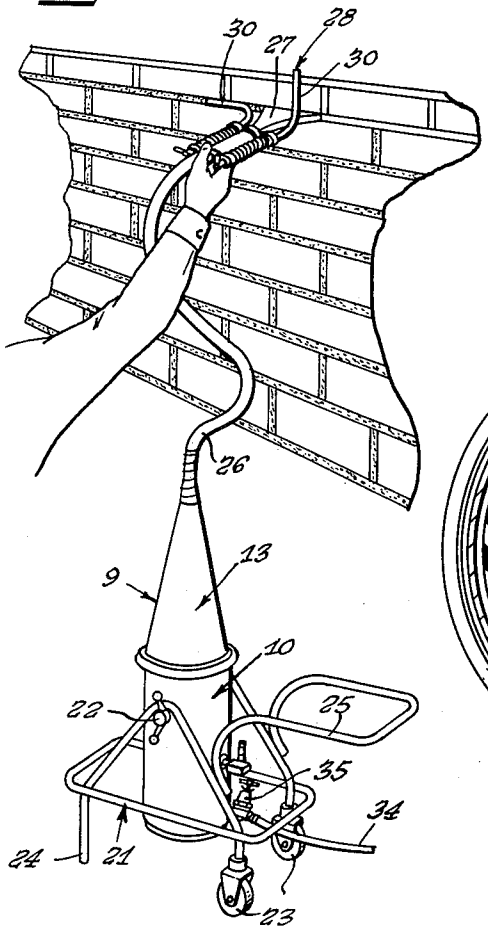


Fig. 4

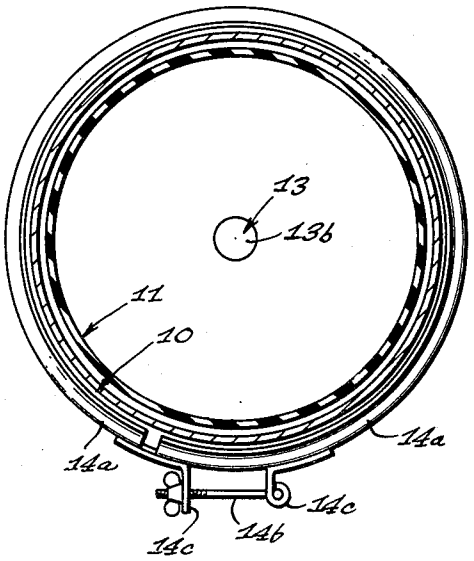


Fig. 6

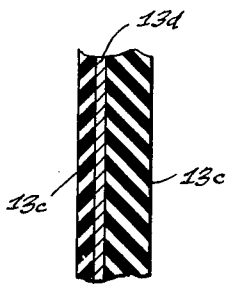
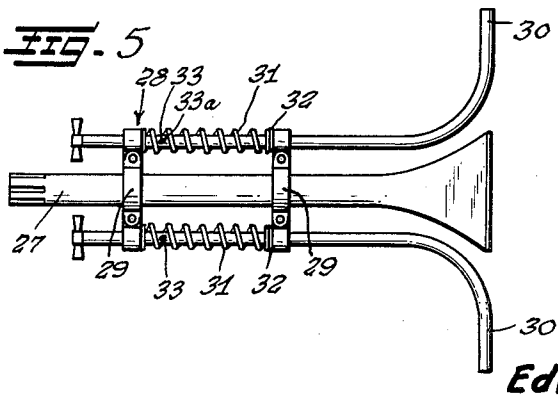


Fig. 5



Inventor
Edward F. Frume

By Hill, Sherman, Meroni, Gross & Simpson Attys

Dec. 22, 1964 E. F. FRUME 3,162,328

DISPENSER FOR SEMI-INERT FLUID MATERIAL

Filed Feb. 28, 1961

4 Sheets-Sheet 2

Fig. 2

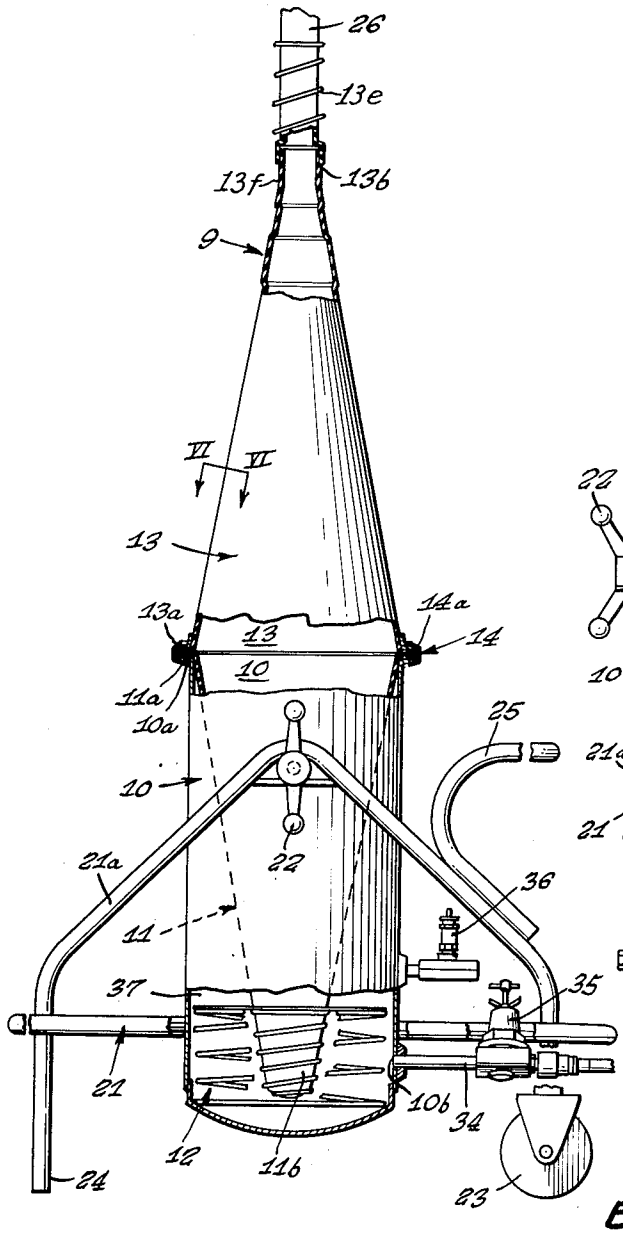
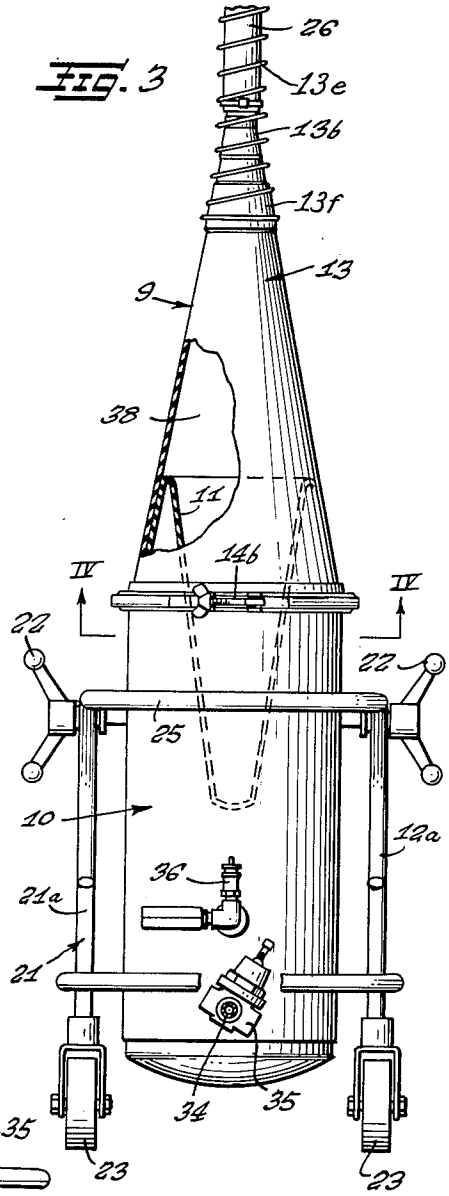


Fig. 3



Inventor

Edward F. Frume

By Hill, Sherman, Meroni, Gross & Simpson Attys

Dec. 22, 1964 E. F. FRUME 3,162,328

DISPENSER FOR SEMI-INERT FLUID MATERIAL

Filed Feb. 28, 1961 4 Sheets-Sheet 3

Fig. 7

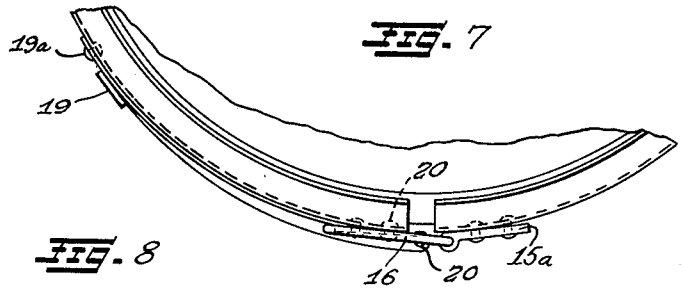


Fig. 8

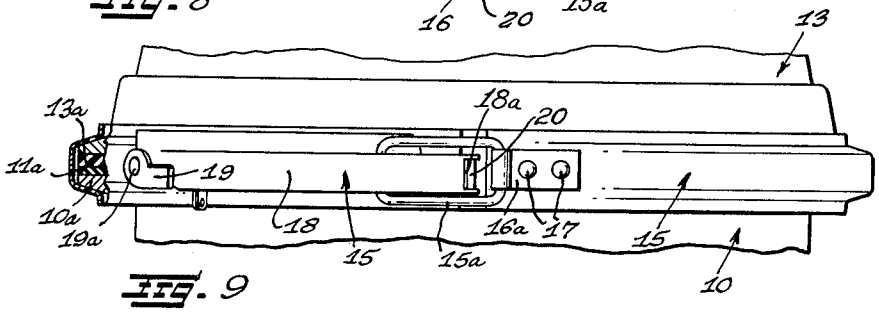


Fig. 9

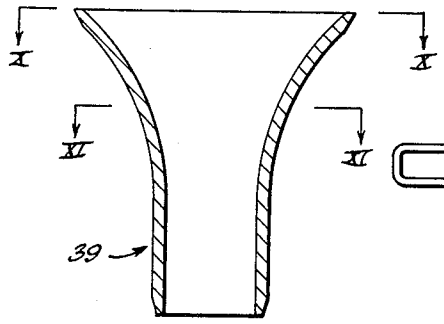


Fig. 10

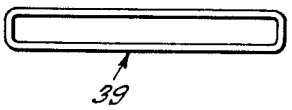


Fig. 11

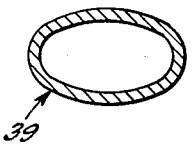


Fig. 12

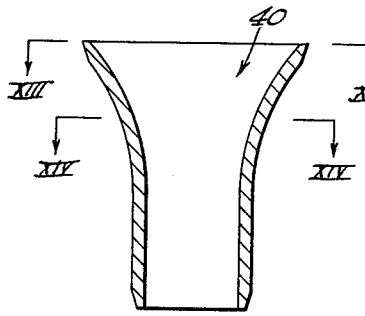


Fig. 13

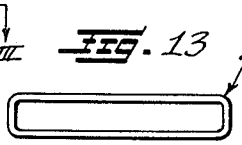
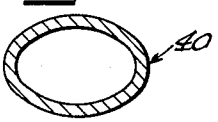


Fig. 14



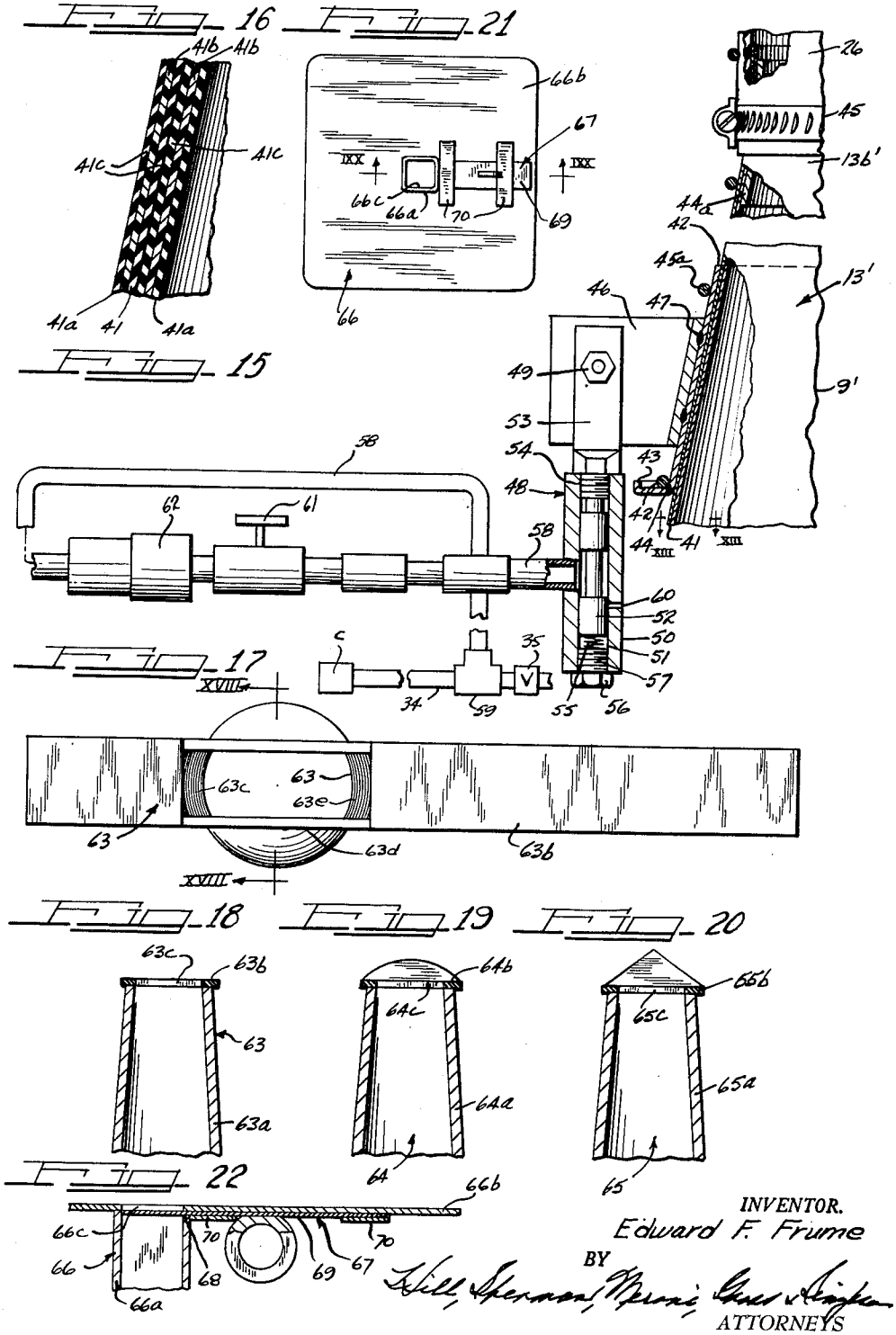
Inventor
Edward F. Frume

By Hill, Sherman, Meroni, Gross & Simpson Attys

Dec. 22, 1964 E. F. FRUME 3,162,328

DISPENSER FOR SEMI-INERT FLUID MATERIAL

Filed Feb. 28, 1961 4 Sheets-Sheet 4



INVENTOR.
Edward F. Frume
BY
Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

United States Patent Office 3,162,328 Patented Dec. 22, 1964

3,162,328

DISPENSER FOR SEMI-INERT FLUID MATERIAL

Edward F. Frume, 1301 W. Parkside Drive, Peoria, Ill.

Filed Feb. 28, 1961, Ser. No. 92,394
16 Claims. (Cl. 222—176)

This application is a continuation-in-part of my former application Serial No. 845,809, filed October 12, 1959, now abandoned.

The present invention relates generally to a dispenser or an apparatus for dispensing inert material, such a mixed cement and mixed mortar. The present invention is more particularly directed towards a dispenser utilizing a suitable means such as fluid pressure utilizing air or liquid. Excellent results may be obtained for inverting the bag where spring means is used in combination with the fluid pressure for turning inside out a collapsible and disposable container carrying the mixed cement or mixed mortar.

The instant dispenser is adapted to be used to apply mortar used in new masonry construction or tuckpointing or in applying grout to complex surfaces. The dispenser may also be used to extrude plaster, caulking compound, concrete, tar substances, and other inert or semi-fluid materials thus making it a much more universal applicator or dispenser as compared to prior art devices.

Formerly, tuckpointing operations were only manually performed in a slow and expensive operation and it is now possible for the first time to mechanize tuckpointing by means of the instant mortar dispenser. The dispenser is portable and may be readily used since disposable containers are adapted to be mounted within the dispenser as a time saving feature.

It is, therefore, an important object of the present invention to provide a dispenser which is capable of dispensing inert materials such as mortar and cement as well as other more fluid materials, under easily regulated pressure, in a controlled manner, attaining a clean weather-resistant sealing joint, characteristic of good tuckpointing workmanship and without soiling adjacent wall areas.

Another object of the present invention is to provide a dispenser having disposable liners or containers.

Yet another very important object of the present invention is to provide a dispenser having a frusto-conical cone cooperable with a collapsible flexible container which cone has a cone angle of not more than 30° to facilitate movement of the material from the container through the frusto-conical cone with a minimum of drag.

A further object of the present invention is to provide a dispenser having spring means to assist in the unloading of the materials from the disposable container.

Still another object of the present invention relates to providing a dispenser adapted to discharge mixed cement, mixed mortar, and other more fluid materials, which dispenser is comprised of a minimum of parts all of which may be economically manufactured and readily assembled and disassembled, as desired.

Other objects and features of the present invention will more fully become evident in view of the following detailed description taken in conjunction with the accompanying drawings illustrating several embodiments, and in which:

FIGURE 1 is a schematic view illustrating the manner of operation of my dispenser during a tuckpointing operation;

FIGURE 2 is an enlarged fragmentary side elevation of the dispenser shown in FIGURE 1 with parts broken away and shown in section high-lighting certain details;

FIGURE 3 is an enlarged fragmentary end elevation of the dispenser shown in FIGURE 1;

FIGURE 4 is an enlarged fragmentary cross-sectional view taken substantially on the line IV—IV looking in the direction indicated by the arrows, as shown in FIGURE 3;

FIGURE 5 is an enlarged plan view of a discharge nozzle and a strike-off device;

FIGURE 6 is an enlarged fragmentary cross-sectional view taken substantially on the line VI—VI looking in the direction indicated by the arrows, as seen in FIGURE 2;

FIGURE 7 is an enlarged fragmentary top view of the clamping device shown in FIGURE 4;

FIGURE 8 is an enlarged fragmentary partially cross-sectioned side view of the clamping device shown in FIGURE 7;

FIGURE 9 is an enlarged cross-sectional view of a discharge nozzle;

FIGURE 10 is an enlarged end view of the discharge nozzle as it appears along the line X—X looking in the direction indicated by the arrows, in FIGURE 9;

FIGURE 11 is a cross-sectional view of the discharge nozzle taken substantially on the line XI—XI looking in the direction indicated by the narrows, as seen in FIGURE 9;

FIGURE 12 is an enlarged cross-sectional view of still another discharge nozzle;

FIGURE 13 is an enlarged end view of the discharge nozzle shown in FIGURE 12, as it appears along the line XIII looking in the direction of the arrows;

FIGURE 14 is a section taken on the line XIV as seen in FIGURE 12;

FIGURE 15 is an enlarged fragmentary partly cross-sectioned view of a modified type of fluid dispenser having a cone vibrator thereon;

FIGURE 16 is an enlarged fragmentary cross-sectional view taken through the wall of the cone substantially on the line XVI—XVI of FIGURE 15;

FIGURE 17 is a top elevation of a fluid or mortar dispensing tool;

FIGURE 18 is a cross-sectional view through the mortar dispensing tool illustrated in FIGURE 17 taken substantially on the line XVIII—XVIII;

FIGURE 19 is a cross-sectional view similar to FIGURE 18 only illustrating a modified type of mortar dispensing tool;

FIGURE 20 is a cross-sectional view illustrating a modified type of mortar dispensing tool similar to the ones illustrated in FIGURES 18 and 19 only illustrating still another modified type of mortar dispensing tool;

FIGURE 21 is a bottom view of still another modified type of mortar dispensing tool; and

FIGURE 22 is a cross-sectional view through the tool illustrated in FIGURE 18 taken substantially on the line XVIII—XVIII.

As shown on the drawings:

The reference numeral **9** indicates generally my dispenser or system or apparatus for discharging under pressure inert materials such for illustration as mixed cement or mixed mortar.

The dispenser **9** is provided with a pressure chamber or a housing **10** which is open at its vertically upper end. A disposable cone or cornucopia **11** is carried within the housing **10**. The cone of disposable material is insertable as a filler downwardly and apexially through the open end of the housing **10** and is provided with a flanged upper filler edge **11***a* which is seated on a chamber or housing edge or flange **10***a* to support the cone in downwardly depending and progressively increased spaced relation to the cylindrical wall of the housing **10**.

To assist in the support of the cone **11**, a spring structure **12** is engaged about a lower conical end **11***b* of the cone **11**. When the cone **11** is filled with material the spring **12** tends to balance the load to facilitate discharge of the contents of the cone **11** through the dispenser **9**.

The spring **12** also operates to center the cone **11** with respect to the cylindrical housing **10** so that the air pressure insertable into the housing may act with the outer surface of the cone **11** to permit the contents of the cone to be emptied.

Mounted on the housing **10** is a conical-like or frusto-conical cover or cone **13**. The cover **13** is adapted to rest at its base on its flanged lower end **13***a*. Internally the cover **13** has a discharge orifice defined by a reduced cone or cover portion **13***b*. Suitable clamp means is provided for securing the cover **13** to the housing **10** and to the cone **11**, as identified at **14**. The clamping means, as illustrated, comprises a pair of C-shaped generally arcuate rings or segments **14***a*, **14***a* which segments bear against the flanges **10***a*, **11***a* and **13***a* to secure them in sealed relation together.

The clamp **14** has an adjustable nut and bolt assembly **14***b* cooperable with terminal flanges **14***c*, **14***c* which flanges are integrally fastened to the arcuate segments **14***a*, **14***a*.

Also provided on the bands or arcuate segments **14***a*, **14***a* is a buckle structure **15** of any suitable type, such as illustrated in FIGURES 7 and 8 of the drawings. The buckle structure **15** includes a loop **16** secured to a strap **15***a* which is riveted at **17**, **17** to one of the arcuate segments **14***a*. The other arcuate segment **14***a* is provided with a buckle member **18** as well as a latch or lock **19**. The buckle member **18** is pivoted on hinge **20** to enable it to be assembled and disassembled with respect to the loop **16**. The loop and the buckle member **18** may be assembled together by hooking the buckle member into the loop **16** and by pivoting the buckle at **20** so that the latch **19** may also be pivoted at **19***a* and engaged on top of the buckle member **18**. In order to secure the buckle member **18** to the arcuate band **14***a*, the buckle member has a flange **18***a* which is riveted to the arcuate band **14***a* at **20***a*. In summary, after the cone **11** filled with inert material has been inserted into the housing or receptacle **10** and after the cover **13** has been placed on top of the cone flange **11***a*, the clamping means **14** may be utilized to secure the members in assembly together. The latch **19** is pivotal at **19***a* so that it can be moved into and out of overlying relation with respect to the buckle member **18** to insure against accidental disassembly of the buckle member **18** with respect to the loop **16**.

The housing **10** is mounted upon a portable cart indicated generally at **21** in any suitable manner. As shown, the cart has a pair of generally U-shaped arms **21***a* and the housing **10** is provided with a pair of fasteners **22**, **22**, studs (or stud axles) and wing nuts for pivotally securing the cart **21** to the housing **10**. The wing nuts are in threaded assembly with the housing **10** via the studs to facilitate assembly with the housing. The cart **21** is mounted on rollers **23**, **23** as well as on legs **24**, **24**. A handle **25** is secured to the cart adjacent to the rollers **23** so that when pressure is applied to it, the legs **24** may be elevated off the ground and the cart may be pushed along the ground surface on its rollers **23**.

The dispenser **9** also is provided with a flexible hose **26** secured to the cover portion **13***b* and a discharge nozzle **27** is secured to the opposite end of the flexible hose **26**, remote from the cover **13**.

A striking tool structure **28** is mounted on the nozzle **27** of the hose **26** and is provided with brackets **29**, **29** which are secured to the nozzle in axially spaced relation. A pair of striking tools **30**, **30** each comprising an arcuate rod in slidable assembly with the brackets **29**, **29**. A pair of springs **31**, **31** are secured to the tools **30**, **30** by means of snap rings **32**, **32** with the springs being disposed axially between the brackets **29**, **29**. The springs **31** thus have a tendency to urge the tools toward the surface being worked upon. Either one or both of the tools may be used, such as is shown in FIGURE 1. If it is desired that only one of the tools **30** be used, the other of the tools **30** may be turned 90° relative to the other of the tools or

else one of the tools may be drawn axially away from the discharge end of the nozzle **27** after pin **33** has been removed from a hole **33***a* in the rod or tool **30**. When this hole **33***a* in the rod **30** is moved through the bracket **29** from between the brackets **29**, **29** to one side of one of the brackets and after the pin **33** has been replaced in the hole **33***a*, the tool **30** may be maintained in a retracted position.

In operation, the cone **11** is filled with material to be extruded and is inserted within the housing **10**. After the cover **13** has been assembled with the housing and after the clamp means have sealed the cover in assembly with the housing, air pressure may be admitted into the housing **10** through its air inlet **10***b* by means of fluid line **34**. An air regulator valve **35** is mounted on the inlet fluid line **34** to aid in the control of the air pressure flowing into the housing **10**. A conventional type of safety valve and pressure gauge assembly **36** is provided to guard against excessive pressure within the dispenser. The flexible cone **11** serves to separate the receptacle into two sub-chambers comprising pressure chamber **37** and material chamber **38**. As the air is admitted into the housing **10** it acts against the flexible cone **11** in such a way that the cone **11** is forced vertically upwardly so that the contents of the cone may be discharged out through the flared nozzle **27**. As the cone **11** is emptied it is progressively moved from within the dispenser housing **10** into the cover **13** as is apparent from FIGURES 2 and 3.

The cone **11** is preferably made from a suitable flexible material such as rubber or a synthetic plastic. The cover **13** may be made from a suitable material although it is preferred that the cover be manufactured from a reinforced material such as is shown in FIGURE 6. The cover **13** in FIGURE 6 includes inner and outer layers of rubber or synthetic material **13***c* separated from one another by a fabric layer **13***d*. It will thus be appreciated that the flanges **11***a* and **13***a* of the cone and cover respectively provide seals to permit the cone and cover to be secured in sealed assembly when the clamping means is engaged in assembly with the flanges **11***a* and **13***a*.

Not only do the cone **11** and the cover **13** cooperate together to provide seals at their juncture to prevent entry of air into the material chamber, but in addition, the cone **11** and the cover **13** have been particularly configurated to facilitate discharge of the materials from the cone **11** through the cover **13** and out through the nozzle **27**. The cover **13** is manually flexible to assist in the movement of its contents should it be necessary. The cone **11** has a relatively small cone angle so that its periphery will be spaced from the cylindrical wall of the housing **10** enabling the air pressure to better act against it for displacing the materials contained within the cone **11**. The cover **13** preferably has a cone angle of not more than 30° to enable mixed mortar and mixed cement to pass through the cover and out through the nozzle **27**. It will be appreciated that mortar and cement of the type that is used to fill in cracks, expansion joints, spaces between bricks, intervals around doors, and windows, contain about 65% to 75% of sand or similar inert material, and only as much water as is necessary to arrive at a relatively stiff mixture. In order to reduce the drag between this type of material and the cover **13** as it passes through the cover it has been found that the cone angle should be 30° or less to satisfactorily extrude this type of material. Furthermore, the cone **11** and the cover **13** are designed without any pockets or sharp angles which might provide areas where the mortar or cement might set. By manufacturing the cone **11** and the cover **13** from flexible non-ferrous materials, the mixed mortar may flow more freely without danger of bonding itself to any parts.

By supporting a portion of the weight of the material within the cone **11**, the spring **12** assists the air pressure in urging all the material directly toward the discharge orifice of the cover **13** as the cone **11** is flexed. Since

the cone 11 prevents intermixing of the pressurized air and the semi-fluid material, there is no blow-by and a steady, uninterrupted flow of material is assured. Likewise, the disposable cone 11 and the cover 13 eliminate the necessity of cleaning the dispenser after use, since both may be replaced, if desired.

Provided on the cover 13 is a spring 13*e* and a conical spring base 13*f*, as shown in FIGURES 2 and 3. The operator may ascertain when the machine is empty, by observing and/or feeling the cover 13 at its junction with the hose generally on top of the area of the base of the spring 13*e*.

Shown in FIGURES 9–14 are two other flared types of nozzles 39 and 40 which are each adapted to insure equal flow volume throughout its length, and a gradual blend from the initial circular section to the final rectangular section. By using nozzles of these types the resistance to the flow of the inert materials may be kept to a minimum. The nozzles may be made from any suitable materials such as cast aluminum and the like.

A modified dispenser indicated generally by the reference character 9′ is illustrated in FIGURES 15 and 16. The cone 13′ is similar to the cone 13 only it is comprised of a double layer or thickness of rubber coated nylon indicated at 41. Each layer of rubber coated nylon is identified at 41*a*, 41*a*. The nylon material in each layer is indicated at 41*b* while the rubber coating is indicated at 41*c*. The cone may be manufactured by using a length of rubber coated fabric 41 and coiling it and securing the opposite ends to the inner and outer sides of the cone 13′ by an suitable means such as tape or glue.

Mounted upon the cone 13′ is a collar 42. The collar 42 has a radially outwardly turned lower end 43 and the spring 45*a* is welded to the radially outwardly extending flange portion 43, as indicating at 44.

The hose 26 is telescoped over the upper end portion 13*b*′ of the cone. A relatively stiff tubular support sleeve 44*a* underlies the lapped junction of the cone portion 13*b*′ and the hose 26. A clamp 45 is used for the purpose of securely attaching the rubber hose with the upper cone portion 13*b*′. The spring 45*a* extends above the clamp 45 to support the hose 26 and to aid in the passage of mortar through the juncture between the hose 26 and the cone 13′ by preventing the hose from kinking at this juncture.

Mounted upon the collar 41 is a vibrator support flange 46, the flange 46 being welded at 47 with the collar 41. A vibrator indicated at 48 is bolted at 49 to the vibrator support flange 46. The vibrator 48 includes a vibrator housing 50 which has a tubular bore 51. Mounted within the bore is a piston 52 which is adapted to execute a reciprocating movement within the bore 51 in the general direction of the axis of the cone 13′.

The vibrator 48 has an upper closure member 53 which is in threaded assembly with the bore 51 of the housing 50, as indicated at 54. It is the closure member 53 that is bolted at 49 to the vibrator support flange 46.

The piston 52 is supported on a spring 55 which is in turn positioned within the bore 51 and supported on a bolt 56. The bolt 56 is in threaded assembly with the bore 51 at the lower end of the housing 50, as indicated at 57. It will be noted in FIGURE 12 that the piston is shown in normal position. Connected with the housing 50 is a fluid line 58 which is in communication with the housing bore 51. When high pressure fluid passes from the compressor *c* to the fluid line 34 to turn the cone 11 inside out some of the fluid is channeled away from the fluid line 34 through the T-shaped connection indicated at 59 into the fluid line 58. It will, therefore, be appreciated that a single compressor may be used to simultaneously turn the cone 11 inside out while operating the vibrator 48.

When air is caused to pass through the fluid line 58 the piston 52 is moved vertically and the spring 55 is compressed. When the piston 52 is moved a sufficient extent the air passing through the fluid line 58 into the bore 51 is vented to atmosphere through the outlet port 60. When the fluid is vented to atmosphere through the outlet port 60, the spring 55 functions to elevate the piston 52 and return it to normal position so that the cycle may again be repeated. The piston or vibrator preferably has a stroke of at least ⅛ inch to ½ inch and moves through 300 to 2500 cycles per minute.

By manufacturing the cone of a flexible rubberized material, the cone may be more readily cleaned after use. Another advantage of constructing the cone of a rubberized coated material is that this type of cone is relatively flexible and the vibrations do not deteriorate the cone as rapidly. If the cone were manufactured from a metal product the vibrations would cause destructive deterioration of the cone 13′. Yet another advantage of the present cone construction resides in the fact that the cone 13′ may be manually worked to cause materials which tend to become lodged at the upper cone end 13*b*′ to continuously flow therethrough. When a dispenser is being used there are times when it is shut down for different lengths of time. When the dispenser is again started, and when the mortar is urged through the hose 26, some of the mortar located at the upper discharge end 13*b*′ of the cone may not be as fluid as it was originally. The operator may manually work the upper end of the cone to cause this material to readily pass through the hose 26 due to the flexible construction of the cone. The side wall of the cone has a thickness of approximately 1/16 of an inch and a material of this thickness may be readily flexed by the hand of the operator.

When the dispenser 9′ is to be shut down for a short period of time, the air pressure passing from the compressor *c* may be shut off from the line 34 by means of quick-disconnect couplings. The fluid flow may also be shut off by operating the pressure reducer valve 35 as shown in FIGURE 1 and FIGURE 12. The fluid flow to the vibrator 48 may be regulated or shut off by operation of the valve 61. It is more desirable to provide shut down valves in close proximity to the vibrator and to the pressure chamber 37 especially where the dispenser 9′ is mounted on a scaffolding at a point removed from the compressor. The operator may operate the valves 35 and 61 while he is on the scaffold without having to shut down the compressor.

The fluid line 58 has a quick coupling 62 which may be attached and detached to the valve 61 without loss of pressure so that the hose 58 may be removed for any desired length of time when the dispenser 9 or 9′ is not in use.

Shown in FIGURES 17–22, inclusive are a series of mortar dispensing tools identified at 63, 64, 65 and 66, respectively. Each of these tools has a tubular shank portion 63*a*, 64*a*, 65*a* and 66*a*, which are adapted to be telescoped within an open end of the hose 26, as is shown in FIGURE 14. Each of the aforesaid tools has a working head indicated at 63*b*, 64*b*, 65*b* and 66*b*. It will be noted that these working heads are differently shaped to perform different types of tuckpointing or mortar dispensing operations. The head at 63*b* is relatively flat, the head 64*b* is relatively circular, the head 65*b* is relatively angular, and the head 66*b* is relatively flat and comprises a "hawk." In each case the mortar dispensing tool has a fluid outlet 63*c*, 64*c*, 65*c* and 66*c* disposed centrally of the working head.

As material or mortar is caused to flow through the hose 26, it moves through the tubular end portion of the mortar dispensing tube in all forms. When the material approaches the vicinity of the working head adjacent the discharge orifice, it will be noted the material is caused to flow between spaced working head areas which are disposed on opposite sides of the outlet. Since the working heads of the tools 63–65 are all of generally the same type, a description of the working tool 63 will suffice for all of them. The upper end of the tubular shank portion

63*a* is altered from circular form to a rectangular configuration in order that the orifice 63*c* will be rectangular. It will be noted that the tubular portion 63*a* is flared and rendered relatively flat, as indicated at 63*d* so that the upper end of the tubular portion 63*a* has a rectangular configuration and merges with the edges of the head 63*b*. When mortar passes through the tubular portion 63*a*, its configuration changes from a circular shape to a rectangular shape as it is emitted from the discharge opening 63*c*. It is by this construction there is less mortar drag in the line and in the tool and then when the mortar is to be emitted the shape of the stream is changed to aid in the movement of the mortar in grooves between bricks.

The working head 63*b* has a width which corresponds generally to the width of the discharge orifice 63*c*. The working head 63*b* is flared at 63*e* so that as the mortar passes from the orifice 63*c* it may more readily be dispensed from the tools 63 into the crack or surface on which or into which the mortar is to be dispensed.

When the dispenser 9 is to be used for tuckpointing a wall, the orifice 63*c* and the width of the working head 63*b* correspond generally to the joint or interval between the bricks. Thus, when the mortar is emitted from the discharge orifice 63*c* it may pass directly into the opening between the bricks and the tool may be moved back and forth as the mortar is being dispensed so that the mortar may be worked into position by the work head 63*b* of the tool. The working head 63*b* extends on opposite sides of the discharge orifice so that the tool may be more readily worked back and forth during the discharge of the mortar into the space between the bricks. The configuration of the working head is adapted to the type of job that is to be done.

In FIGURES 21 and 22, the working tool 66 comprises a "hawk." In certain types of operations, it may be more desirable to accumulate a certain amount of the mortar on top of the working head 66*b* so that it may be manually dispensed onto the surface to which it is applied. Rather than exposing a large amount of the mortar to the atmosphere at one time, a limited amount of mortar may be accumulated on top of the "hawk" so that it may be manually applied to the work surface. The "hawk" 66 shown in FIGURES 21 and 22 is provided with a cut-off valve as indicated at 67. This cut-off valve comprises a relatively flat flange which is adapted to be telescoped into the opening 68 of the tubular portion 66*a*. This shut-off valve 67 includes a valve plate or flange 69 which is held on the "hawk" 66 by means of support plates 70 which are welded to the underside of the "hawk." The valve plate 69 may be moved transversely to the tubular portion 66*a* to permit mortar to pass through the discharged outlet 66*c* or to cut-off the flow.

The tools shown in FIGURES 17–20 may be provided with cut-off valves of the type shown at 67 in FIGURES 21 and 22.

In conclusion, it will be appreciated that the instant system or dispenser enables tuckpointing operations to be mechanized and no longer is it necessary to perform tasks of this type manually which in the past has been a slow and expensive operation. The instant apparatus enables the cracks to be filled at a much greater speed with good penetration to considerably greater depths than has been possible in the past.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. In a system for discharging under pressure an inert material such for illustration as mixed cement including a chamber open at one end, the combination comprising a cornucopia of material insertable as a filler downwardly and apexially through said open end into said chamber and having a flanged upper filler edge to seat on an edge of said open end to support said cornucopia in downwardly depending and progressively increased spaced relation to the wall of said chamber, a conical-like cover comprised of a flexible material to resist cement adherence thereto for said chamber having a discharge orifice at its apex and resting at its base on said flanged upper filler edge, said cover having a continuous uninterrupted conical surface engageable with the inert material which continuous interrupted conical surface has a cone angle of between 10° to 30°, means for detachably securing said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the wall of said cornucopia being resiliently yieldable, and means to apply pressure over substantially the entire area of said cornucopia to progressively turn the wall of said cornucopia inside out and upwardly into said conical cover for discharging the material in the cornucopia out of said cover orifice.

2. In a system for discharging under pressure an inert material such for illustration as mixed cement including a chamber open at one end, the combination comprising a cornucopia of material insertable as a filler downwardly and apexially through said open end into said chamber and having a flanged upper filler edge to seat on an edge of said open end to support said cornucopia in downwardly depending and progressively increased spaced relation to the wall of said chamber, a conical-like cover comprised of a flexible rubberized fabric for said chamber having a discharge orifice at its apex and resting at its base on said flanged upper filler edge, said cover having a continuous uninterrupted conical surface engageable with the inner material and with the cornucopia, when inverted, and which conical surface has a cone angle between 10° to 30°, means for detachably securing said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the wall of said cornucopia being resiliently yieldable, means to apply pressure over substantially the entire area of said cornucopia to progressively turn the wall of said cornucopia inside out and upwardly into said conical cover for discharging the material in the cornucopia out of said cover orifice, and central guiding and load balancing means at the base of said chamber encompassing and engaging a lower apexial portion of said cornucopia which means functions to exert a force against the cornucopia in a direction towards the discharge orifice to facilitate discharge of the material in the cornucopia when it is loaded most heavily, said cornucopia being cone-shaped and similar in shape to said conical-like cover enabling the cornucopia to fit snugly into the cover when inverted to enable the mixed cement to be progressively wiped from the wall of the cover and forced through the cover orifice as the cornucopia is inverted.

3. In an apparatus for discharging under pressure an inert material such for illustration as mixed mortar and mixed cement, the combination comprising a chamber open at one end, a cone-shaped disposable receptacle containing inert material insertable as a filler downwardly and through said open end into said chamber and having a flanged upper filler edge to seat on an edge of said open end to support said disposable container in downwardly depending spaced relation to the wall of said chamber, a frusto-conical cover for said chamber having a discharge orifice at its reduced end and resting at its base on said flanged upper filler edge, means for detachably securing said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the wall of said disposable receptacle being resiliently yieldable, and means to apply pressure over substantially the entire area of said receptacle to progressively turn said wall of said cone-shaped disposable receptacle inside out and upwardly into said frusto-conical cover for discharging the contents of the disposable receptacle out of said cover orifice, said frusto-conical cover having a cone angle of not more than 30°.

4. In an apparatus for discharging under pressure an

inert material such for illustration as mixed mortar and mixed cement, the combination comprising a chamber open at one end, a generally conical receptacle containing inert material insertable as a filler downwardly and through said open end into said chamber and having a flanged upper filler edge to seat on an edge of said open end to support said disposable container in downwardly depending spaced relation to the wall of said chamber, a frusto-conical cover for said chamber having a discharge orifice at its reduced end and resting at its base on said flanged upper filler edge, said cover and said generally conical receptacle being similarly configurated for snug nested engagement together upon inversion of said receptacle into said cover, means for detachably securing said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the wall of said disposable receptacle being resiliently yieldable, means to apply pressure over substantially the entire area of said receptacle to progressively turn said wall of said disposable receptacle inside out and upwardly into said frusto-conical cover for discharging the contents of the disposable receptacle out of said cover orifice, said frusto-conical cover having a cone angle of not more than 30°, and central guiding and load balancing means at the base of said chamber for encompassing a lower end of said disposable receptacle which means functions to exert a force against the receptacle in a direction towards the discharge orifice to facilitate discharge of the material in the disposable receptacle when it is most heavily loaded with inert material.

5. In a system for discharging under pressure an inert material such for illustration as mixed mortar including a pressure chamber having a flanged chamber edge open at one end, the combination comprising a cornucopia of material insertable as a filler downwardly and apexially through said open end into said chamber and having a flanged upper filler edge to seat on the flanged chamber edge of said open end to support said cornucopia in downwardly depending and progressively increased spaced relation to the wall of said chamber, a conical-like cover for said chamber having a discharge orifice at its apex and having a flanged cover edge at its base resting on said flanged upper filler edge, said cover having a continuous uninterrupted conical surface engageable with the inert material which continuous uninterrupted conical surface has a cone angle of not more than 30°, a channeled strap of U-shaped cross-section including a buckle structure detachably securing said flanged edges of said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the buckle structure including a loop at one end of the strap and a circumferentially pivotal buckle member at an opposite end of the strap for engagement through the loop, the buckle structure further including means for securing the buckle member in clamped engagement with the loop, the wall of said cornucopia being resiliently yieldable, and means for applying pressure to the interior of said chamber to progressively turn the wall of said cornucopia inside out and upwardly into said conical cover for discharging the material in the cornucopia out of said cover orifice.

6. In a dispenser for semi-fluid material such as cement, the combination comprising a receptacle adapted to receive fluid under pressure from an external source, a cone secured at its base to the open top of the receptacle, a material discharge outlet secured to the apex of the cone, a collapsible cone-shaped container in sealed relationship inside the receptacle, and spring means between one wall of said receptacle and said container to center said container axially of said discharge opening, said cone having a cone angle of 10° to 30° to facilitate discharge of the cement from the material discharge outlet.

7. In a dispenser for semi-fluid material such as mortar and cement, the combination comprising a fluid-tight outer housing comprising a receptacle connected to a fluid pressure source and a cone secured at its base to the open top of the receptacle, seal means disposed between the receptacle and the cone, clamp structure securing the cone to the receptacle, a material discharge opening at the apex of the cone, a dispensing hose secured at one of its ends to the discharge opening and having a dispensing nozzle secured at its other end, a flexible cone-shaped diaphragm in sealed relationship inside the outer housing to form a material receiving chamber and a pressure chamber within the housing, spring means projecting upwardly from the bottom of the receptacle to center the cone-shaped diaphragm coaxially of the discharge opening, the cone having a cone angle of about 10° to 30° cooperable with the diaphragm to facilitate discharge of the material with a minimum of friction between the material and the cone.

8. In a dispenser for semi-fluid material such as cement, the combination comprising a receptacle adapted to receive fluid under pressure from an external source, a flexible walled cone secured at its base to the open top of the receptacle, a material discharge outlet secured to the apex of the cone, a collapsible, generally conical, material container shaped for nested engagement within said cone in sealed relationship inside the receptacle, spring means between one wall of said receptacle and said container to urge said container toward said discharge opening, said cone having a cone angle of not more than 30° to facilitate discharge of the cement from the material discharge outlet, and a cone vibrator mounted on said cone adjacent its material discharge outlet for vibrating the cone coaxially of its longitudinal axis to facilitate discharge of the cement from the material discharge outlet.

9. The dispenser of claim 8 further characterized by the cone being comprised of a double thickness of rubber coated textile material of approximately $\frac{1}{16}$ inch thickness, the cone being flexible so that mortar may be readily dislodged from the cone and so the vibrations transmitted to the cone cannot cause deterioration of the cone.

10. The dispenser of claim 8 further characterized by the cone being comprised of a rubber coated nylon at its radially inner and outer sides so that it may be readily cleaned and so that the mortar will not readily combine therewith.

11. An apparatus for pressure discharging an inert material, the apparatus including a portable cart having rollers to permit the cart to be readily moved, a chamber open at one end mounted on said cart, means joined with the cart and the chamber permitting the chamber to be rotated 360° relative to the cart through a range of selected positions and with the chamber being fixedly securable and relative to the cart in any one of the selected positions, a disposable cone-shaped receptacle containing inert material insertable as a filler downwardly and through said open end into said chamber and having a flanged upper filler edge to seat on an edge of said open end to support said disposable receptacle in downwardly depending spaced relation to the wall of said chamber, a frusto-conical cover for said chamber having a discharge orifice at its reduced end and resting at its base on said flanged upper filler edge, means for detachably securing said chamber and cover together with said flanged upper filler edge tightly sealed therebetween, the wall of said receptacle being resiliently yieldable, said receptacle having a shape corresponding generally to the shape of said frusto-conical cover for snug engagement with an interior surface of said cover upon inversion of said receptacle and means for applying pressure to the interior of said chamber to progressively turn said wall of said disposable receptacle inside out and upwardly into said frusto-conical cover for discharging the contents of the disposable receptacle out of said cover orifice, said frusto-conical cover having a cone angle of no more than 30°.

12. An apparatus for dispensing an inert cement-like

material, the apparatus including a portable cart having rollers to permit the cart to be readily moved, a receptacle adapted to receive fluid under pressure from an external source being mounted on said cart, means joined with the cart and the receptacle permitting the receptacle to be tilted relative to the cart through a range of selected positions and with the receptacle being fixedly securable relative to the cart in any one of the selected positions, a cone comprised of a flexible material to which mortar does not readily cling and with the cone being secured at its base to the open top of the receptacle, a material discharge outlet disposed at the apex of the cone, a collapsible cone-shaped material container in sealed relationship inside the receptacle, spring means between one wall of said receptacle and said container to balance the container and to center the container coaxially of said discharge opening, said cone having a cone angle of not more than 30° to facilitate discharge of the cement from the material discharge outlet, a cone vibrator mounted on an exterior surface of said cone adjacent its material discharge outlet for vibrating the cone to facilitate discharge of the cement from the material discharge outlet, the vibrator having a piston which moves generally longitudinally of the cone.

13. In a dispenser for semi-fluid material such as cement, the combination comprising a receptacle adapted to receive fluid under pressure from an external source, a cone comprised of a flexible long wearing fabric secured at its base to the open top of the receptacle, a material discharge outlet disposed at the apex of the cone, a collapsible cone-shaped container aligned coaxially of said cone and shaped for nested inversion with said cone in sealed relationship inside the receptacle for carrying semi-fluid material therein, said cone having a continuous uninterrupted conical surface engageable with the inert material contained within the container as the container is turned inside out into said cone, said cone having a cone angle of between 10° to 30° to facilitate discharge of the cement from the material discharge outlet, and means for applying fluid pressure to said collapsible material container in said receptacle to progressively turn the wall of the material container inside out and into wiping engagement with the conical surface of said cone for progressively discharging the material in the container out of said material outlet.

14. In a dispenser for semi-fluid material such as cement, the combination comprising a receptacle adapted to receive fluid under pressure from an external source, a cone comprised of a flexible non-ferrous material secured at its base to the open top of the receptacle, a material discharge outlet disposed at the apex of the cone, a collapsible container in sealed relationship inside the receptacle having a continuous uninterrupted conical wall comprised of a flexible long wearing fabric for carrying semi-fluid material therein, said cone having a continuous uninterrupted conical surface engageable with the inert material contained within the container as the conical wall of the container is turned inside out into said cone, said cone having a cone angle of between 10° to 30° to facilitate discharge of the cement from the material discharge outlet, and means for applying fluid pressure to said collapsible container in said receptacle to progressively turn the conical wall of the material container inside out and wiping the conical surface of said cone for discharging the material in the container out of said material outlet.

15. In a dispenser for semi-fluid material such as cement, the combination comprising a receptacle adapted to receive fluid under pressure from an external source, a cone comprised of a flexible non-ferrous material secured at its base to the open top of the receptacle, a material discharge outlet disposed at the apex of the cone, a collapsible container in sealed relationship inside the receptacle having a continuous uninterrupted conical wall comprised of a flexible long wearing fabric for carrying semi-fluid material therein, said cone having a continuous uninterrupted conical surface engageable with the inert material contained within the container as the conical wall of the container is turned inside out into said cone, said cone having a cone angle of between 10° to 30° to facilitate discharge of the cement from the material discharge outlet, means for applying fluid pressure to said collapsible container in said receptacle to progressively turn the conical wall of the material container inside out and wiping the conical surface of said cone with the conical wall of said container for discharging the material in the container out of said material outlet, and a cone vibrator mounted externally on said cone adjacent its material discharge outlet for vibrating the cone to facilitate discharge of the cement from the material discharge outlet.

16. A tuck-pointing dispenser for semi-fluid material such as cement comprising a receptacle adapted to receive fluid under pressure from an external source, a cone and a collapsible cone-shaped container each comprised of a flexible long wearing fabric, the cone being secured at its base to the open top of the receptacle and having a material discharge outlet disposed at the apex of the cone, means supporting said collapsible cone-shaped container in an up-side-down position within the receptacle for carrying semi-fluid material therein, said cone having a continuous uninterrupted conical surface engageable with the inert material contained with an inside conical wall of the cone-shaped container as the container is turned inside out into said cone, said cone having a cone angle of between 10° to 30° to facilitate discharge of the cement from the material discharge outlet, and means for applying fluid pressure to said collapsible cone-shaped container in said receptacle to progressively turn the wall of the material container inside out and against said conical surface of said cone for wiping said conical surface as the material in the container is discharged out of said material outlet.

References Cited in the file of this patent

UNITED STATES PATENTS

425,221	Harden	Apr. 8, 1890
1,547,937	Miller	July 28, 1925
2,345,669	Harman et al.	Apr. 4, 1944
2,471,852	Bau	May 31, 1949
2,509,570	Lee	May 30, 1950
2,618,149	Lynn	Nov. 18, 1952
2,622,434	Rutka	Dec. 23, 1952
2,731,297	Meyer	Jan. 17, 1956
2,732,099	Davis	Jan. 24, 1956
2,735,589	Milster et al.	Feb. 21, 1956
2,761,305	Davis	Sept. 4, 1956
2,819,679	Wilson	Jan. 14, 1958
2,865,541	Hicks	Dec. 23, 1958
2,924,359	Beremand	Feb. 9, 1960
2,929,355	Paguette	Mar. 22, 1960