

July 25, 1967

R. S. HAMILTON

3,332,576

DENTIFRICE DISPENSING HEAD

Filed March 4, 1966

2 Sheets-Sheet 1

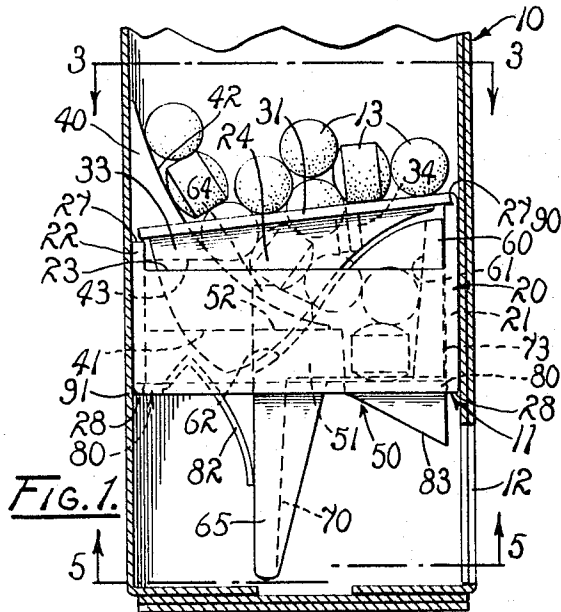


FIG. 1.

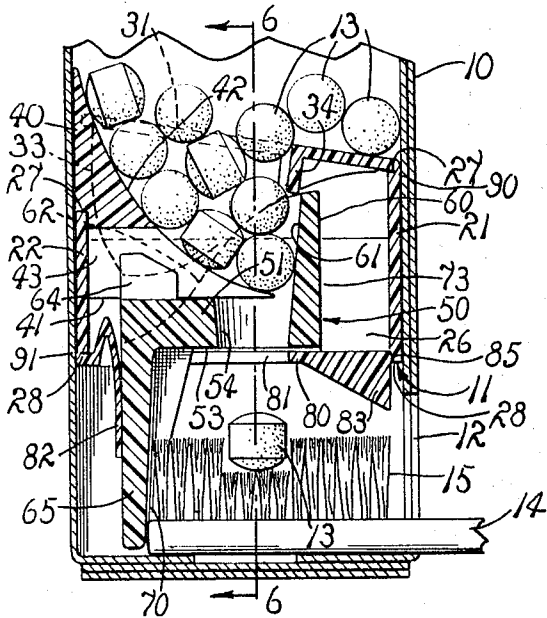


FIG. 2.

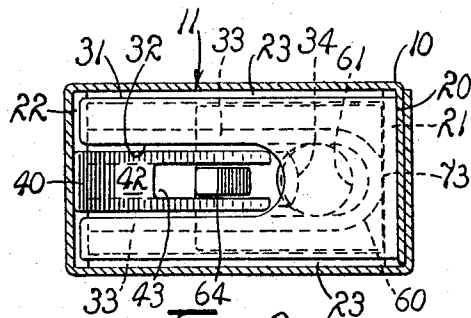


FIG. 3.

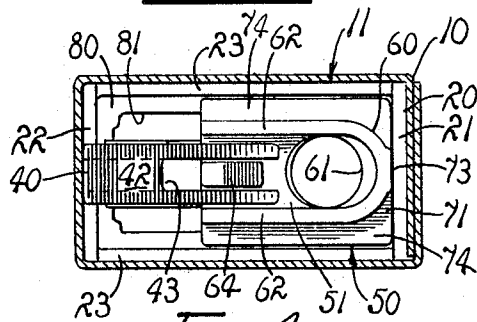


FIG. 4.

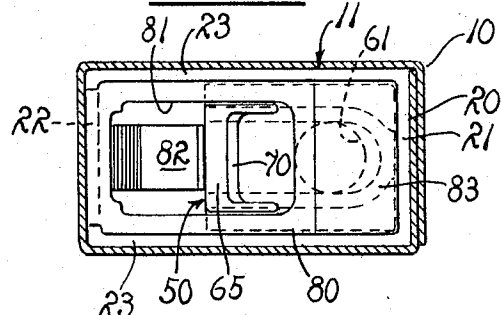


FIG. 5.

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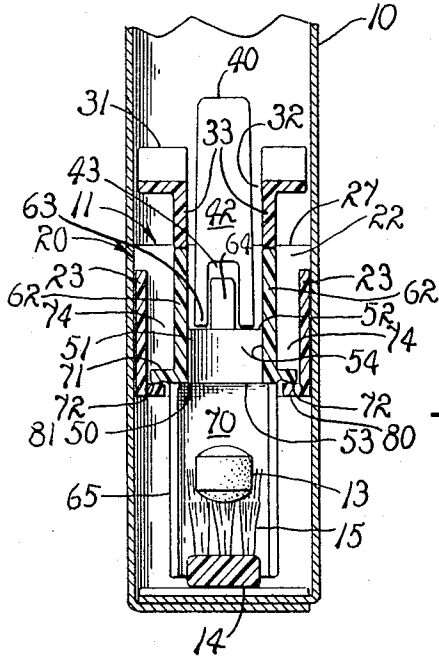


FIG. 6.

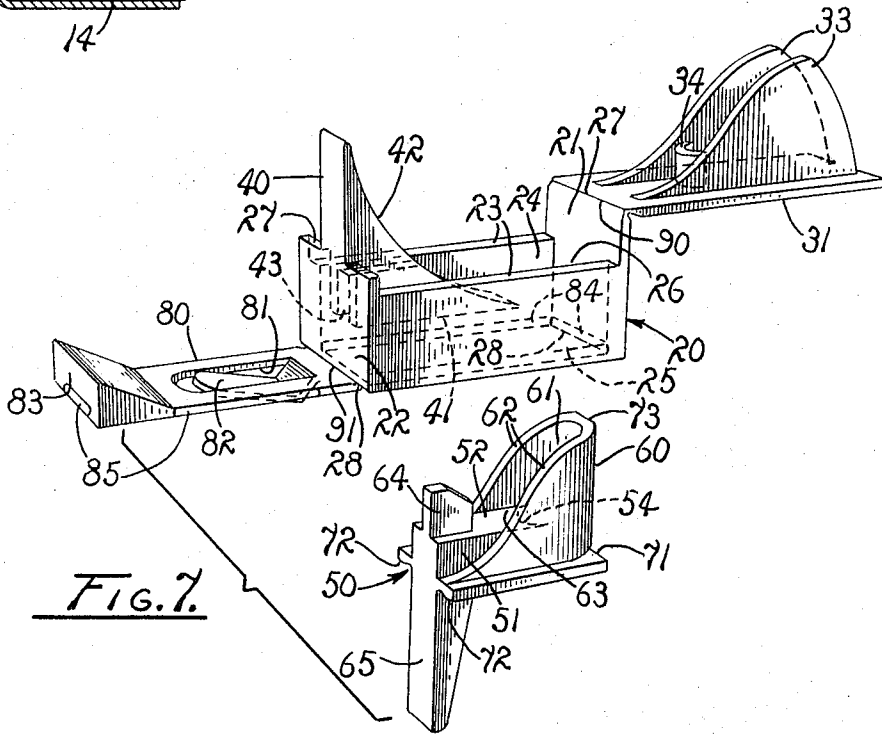


FIG. 7.

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3,332,576

**DENTIFRICE DISPENSING HEAD**  
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Filed Mar. 4, 1966, Ser. No. 531,664  
7 Claims. (Cl. 221-202)

The present invention relates to a dentifrice dispensing head and more particularly to such a device which easily and conveniently discharges a single, or other predetermined number of dentifrice pellets at a time.

It is recognized that the device of the present invention has application to other types of operations such as the dispensing of vitamin, salt and other tablets. However, for illustrative convenience, its application to the dispensing of dentifrice is described as typifying its utility.

Conventionally, dentifrice dispensers have been designed to dispense powder, paste, or liquid types of dentifrice. While all of these forms of dentifrice have proved to be more or less effective once they are applied to the teeth, several drawbacks exist in the methods in which they are dispensed. Ordinarily no provision is made for dispensing a precise amount for each instance of use. Thus, the dentifrice is either poured or squeezed from its container, resulting in wide variation in the quantity of dentifrice obtained. Consequently the effectiveness of the brushing operations varies and such dispensing usually proves to be wasteful, particularly when performed by children.

A further disadvantage resides in the characteristics of such dentifrice. The powder, liquid, and paste dentifrices are easily spilled during use thus not only causing waste, but also soiling or otherwise damaging clothes and other articles in the area. Hygienically the use of these types of dentifrice is often unsatisfactory. Since usually the dentifrice is dispensed from its container while its spout is in contact with the bristles of the toothbrush, the danger of transmitting germs to the user is always present. Not only may germs gather on the spout while the container is stored, but also, particularly in families, germs may easily be passed among the persons who use the container of dentifrice.

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Recently a new type of dentifrice dispenser has been patented under Patent No. 3,191,803. This dispenser employs pellets of dentifrice, cooperating dispensing head, container, and a toothbrush which substantially eliminate many of the aforementioned problems. The device of the present invention is intended to provide improvements both in operation and construction in the dispensing head of this type of dentifrice dispenser.

It is an object of the present invention to provide an improved dentifrice dispensing head for pelletized dentifrice.

Another object is to provide a dentifrice dispensing head which dispenses pellets of dentifrice of predetermined size singly or in predetermined multiples at a time.

Another object is to provide such a device which dispenses dentifrice onto a toothbrush while at no time coming in contact with the bristles of the toothbrush.

Another object is to provide such a dispensing head which is activated by a toothbrush.

Another object is to provide a dispensing head which is adaptable to various types of dispensing operations and to various types of containers.

A further object is to provide a dispensing head, the parts of which are easy to form and assemble, while being efficient and durable in operation.

A still further object is to provide such a dispensing head which is inexpensive to construct.

These, together with other objects, will become more fully apparent upon reference to the following description and accompanying drawings.

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In the drawings:

FIG. 1 is an enlarged vertical longitudinal section of a dentifrice dispensing head embodying the principles of the present invention mounted within an appropriate dispensing container.

FIG. 2 is an enlarged vertical longitudinal section of the dispensing head in the dispensing position.

FIG. 3 is a top view of the dispensing head taken on line 3-3 of FIG. 1.

FIG. 4 is a top view of the invention taken on approximately line 3-3 of FIG. 1 but with an agitator plate thereof removed.

FIG. 5 is a bottom view of the invention taken on line 5-5 of FIG. 1.

FIG. 6 is a vertical section taken on line 6-6 of FIG. 2.

FIG. 7 is a disassembled perspective view of the dispensing head showing its component parts.

Referring in greater particularity to the drawings, FIGS. 1 and 2 illustrate a container or reservoir 10 providing a dentifrice dispensing head 11 and having a toothbrush insert opening 12 in communication with the interior of the container below the dispensing head. Dentifrice pellets 13 of predetermined dimension are held within the container above the dispensing head. A toothbrush 14 of the type described in Patent No. 3,191,803, having bristles 15 is shown in FIG. 2 inserted through the opening into the interior of the container. It will become apparent upon further description that the dispensing head is adaptable to other types of containers than the one shown.

The dispensing head 11 may be formed from plastic, as herein described, or of any other suitable material. When the device is formed from plastic, it has been found that abrasive surfaces should be of plastics of different hardness in order to facilitate movement and durability.

The dispensing head 11 consists of a rectangular housing 20 having first and second parallel end walls 21 and 22 respectively and parallel side walls 23 defining an upwardly disposed receiving opening 24, a downwardly disposed dispensing opening 25, and a chamber 26 therebetween all of which serve as a discharge passage. The walls have upper edges 27 and lower edges 28. The end walls extend predetermined distances above the upper edges of the side walls as shown best in FIG. 7. A cove 29 is provided interiorly of the housing about the dispensing opening.

An agitator plate 31 is hingeably mounted on the upper edge 27 of the first end wall 21 and may be rotated to a position in covering relation to the receiving opening 24. A centrally located receiving slot 32 runs longitudinally from the distal end of the plate a predetermined distance toward its connection with the end wall. Parallel cam lobes 33 are mounted longitudinally and normal to the plate on each side of the receiving slot in such a way that when the plate is moved into covering relation to the receiving opening 24, the lobes extend into the chamber 26. An arcuate guide wall 34 is affixed to the plate between the cam lobes a predetermined distance from the distal end of the plate.

A division finger 40 having a bottom end 41 is provided on the second end wall 22 of the housing 20. It extends a predetermined distance longitudinally within the chamber 26 centrally between the side walls 23. The division finger affords an upward facing arcuate dentifrice guiding surface 42 which extends through the slot 32 when the agitator plate is in covering relation to the receiving opening 24. A vertical keyway 43 is provided in the bottom end of the division finger.

A metering slide 50 is reciprocally received in the chamber 26 of the housing 20 and adapted to be moved between predetermined dispensing and passage blocking positions. It is composed of a body member 51 having upper and lower surfaces 52 and 53 respectively and pro-

vides a concave slightly downwardly sloping end wall 54 opposite to the first end wall 21 of the housing. A cam wall 60 defines a vertical conical passage 61 with the end wall 54 of the body 51 and affords parallel cam arms 62 on each side of the body. The dimensions of the portion of the passage in connection with the lower surface 53 of the body are slightly larger than the largest diameter of one of the pellets 13 to be dispensed. The device may be constructed to dispense predetermined multiples of pellets by enlarging the size of the passage and adjusting the size of the division finger accordingly. The cam arms define a channel 63 on the upper surface of the body which is in communication with the passage. A vertical upwardly projecting key 64 is mounted on the upper surface 52 of the body at the end thereof opposite to the second end wall 22 of the housing. A vertical trigger arm 65 integral with the body extends downwardly below the key and provides a pressure applying surface 70 facing the first end wall of the housing. A lip portion 71 having an outer edge extends about the periphery of the slide normal to the cam wall 60 and its outer edge conforms to the inner dimensions of the housing. Runner edges 72 are affixed in parallel relation to the side walls 23 of the housing at the lower extremities of the lip portion. An abutment plate 73 is mounted vertically on a section of the cam wall directly opposite to the first end wall of the housing. The cam wall, the side walls of the housing and the lip portion define a residue accumulating area 74.

A retainer plate 80 having inner and outer surfaces and a peripheral edge is mounted within the dispensing opening 25 of the housing 20 with the metering slide 50 reciprocally received within the chamber 26. A dispensing slot 81 is provided longitudinally of the retainer plate a predetermined distance from a position adjacent to the second end wall. A leaf spring 82 is mounted adjacent to the hingeable connection and extends within the dispensing slot. A wedge-shaped distributor plate 83 is affixed to the outer surface of the retainer plate at the end thereof remote from the second end wall. Beads 85 are provided about the peripheral edge of the retainer plate. In mounting the plate on the housing 20 the beads are received within the cove 84 of the housing as indicated in FIG. 2. The runner edges 72 rest on the inner surface of the retainer plate and the leaf spring presses against the trigger arm 65 to urge the metering slide into abutment against the first end wall 21 in the passage blocking position.

For purposes of simplicity and economy of construction, the dispensing head 11 can be die cast, or otherwise formed, in two component parts as shown in FIG. 7. In this case one part is the metering slide 50 including the body member 51, cam wall 60, cam arms 62, key 64, trigger arm 65, lip portion 71, runner edges 72, and abutment plate 73. The other part is the housing 20 with the agitator plate 31, retainer plate 80, division finger 40, and all related elements excluding those of the metering slide integral therewith. When constructed in this manner the agitator plate is integral with the housing along a fold line 90 of reduced thickness, as shown in FIG. 7 in order to make the plate pivotal on the housing. The retainer plate 80 is also integral with the housing along fold line 91 of reduced thickness in order to make it pivotal on the housing. Thus in assembly the metering slide 50 is received within the chamber 26 of the housing and the retainer plate 80 is pivotal, with the trigger arm 65 received through the dispensing slot 81, and secured in position within the dispensing opening 25. Thus the runner edges 72 rest on the inner surface of the retainer plate and the leaf spring presses against the trigger arm 65 to urge the metering slide into abutment against the first end wall 21 in the passage blocking position.

#### Operation

The operation of the described embodiment of the subject invention is believed to be readily apparent and is briefly summarized at this point. A container such as

the one indicated at 10, provides the dentifrice dispensing head 11 of the present invention, and is filled with the dentifrice pellets 13. The pellets are supported within the container by the dispensing head. The guide wall 34 of the agitator plate 31 extends into the chamber 26 so that a single row of pellets is supported on the dentifrice guiding surface 42 above the passage containing one of the pellets to be dispensed.

When a dentifrice pellet 13 is to be dispensed, a toothbrush 14 is inserted through the opening 12 of the container 10 with the bristles 15 upwardly extended. The toothbrush is urged against the surface 70 of the trigger arm 65 which is somewhat restrained from movement by leaf spring 82. The pressure exerted on the trigger arm must be enough to overcome the pressure of the leaf spring. In this way the metering slide connected to the trigger arm is moved forward toward the second end wall 22 guided by its key 64 in the keyway 43 and division finger 40 within the channel 63, and is carried on the runner edges 72 to minimize friction.

As the metering slide 50 is moved forwardly, several novel operations take place simultaneously. The forward movement of the cam arms 62 of the metering slide 50 forces the cam lobes 33 to rotate the agitator plate 31 away from the receiving opening 24. This causes the pellets 13 to be agitated within the container 10 which insures that they do not jam and obstruct the receiving slot 32 of the agitator plate. Concurrently the cam wall 60 moves toward the division finger forcing the row of pellets above the one to be dispensed up the guiding surface 42. Simultaneously, the dimensions of the pellet and of the passage cause the pellet to be rotated to a substantially horizontal position within the passage by the bottom 41 of the division finger as the metering slide moves forwardly.

Subsequently the metering slide 50 reaches the dispensing position with the passage 61, dispensing slot 81, and toothbrush 14 in alignment. The pellet 13 falls under gravity from the passage, through the dispensing slot, and onto the bristles 15 of the toothbrush, as shown in FIG. 2.

Following the depositing of the pellet 13 on the toothbrush 14, the toothbrush is withdrawn from the container. As this is done, the part of the pellet extending above the toothbrush contacts the distributor plate and is spread over the rearwardmost bristles 15 of the toothbrush. It should be pointed out that at no time does the distributor plate contact the bristles thus preventing the un-hygienic aspects of common dispensers.

The trigger arm 65 under the pressure of the leaf spring 82 urges the metering slide toward abutment with the first end wall 21 again as the toothbrush is drawn out of the container through the opening 12. Thus the vacant passage 61 of the metering slide 50 moves out from under the division finger. The cam wall 60 moves away from the division finger thus allowing the row of pellets to move down the guiding surface 42 until the leading pellet falls under gravity into the passage as the abutment plate 73 of the slide abuts against the first end wall 21 in the loading position. The operation is repeated for each dispensing of a pellet.

Residue which filters down through the container from the pellets 13 is either dispensed through the passage 61 during operation, or received in the accumulating area 74 above the lip 71, and is consequently restrained from contact with the rubbing surfaces. Thus not only is excessive wear eliminated, but what residue does remain in the device is easily removed by inverting the device and pouring the residue out of the area 74. Furthermore, once the supply of pellets in the container is exhausted, the residue can be poured from the accumulating area out through an opening provided in the top of the container and the container refilled with a fresh supply of pellets for further use of the device.

Although the invention has been herein shown and de-

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scribed in what is conceived to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A dispensing head comprising a housing having opposite ends; a reservoir disposed above the housing and adapted to deliver material to be dispensed thereto; a metering slide mounted for reciprocal movement within the housing between predetermined loading and discharging positions and having a passage of predetermined volume adapted to receive material from the reservoir when the slide is in the loading position; an agitator pivotally mounted on an end of the housing within the reservoir in closing relation to said passage and having a filling opening therethrough; a downwardly disposed cam mounted on the agitator; an upwardly disposed cam mounted on the slide engageable with the cam on the agitator to raise the agitator as the slide is moved toward discharging position and to lower the agitator as the slide moves toward loading position, said slide having a longitudinal channel communicating with its discharge passage and extended longitudinally thereof in the direction of movement toward the discharging position; and a division finger mounted on the end of the housing toward which the slide moves in traveling to discharging position extended longitudinally of the channel of the slide to a position disposed transversely of the passage when the slide is in discharging position.

2. A dispensing head comprising a housing having an upwardly disposed opening, opposite ends, and a downwardly disposed discharge opening; a reservoir disposed above the housing adapted to deliver material to be dispensed into the upwardly disposed opening of the housing; a metering slide mounted for reciprocal movement within the housing between predetermined loading and discharging positions and having a passage of predetermined volume adapted to receive material from the reservoir when the slide is in the loading position; an agitator pivotally mounted on an end of the housing in covering relation to the upwardly disposed opening of the housing and having a restricted filling opening therethrough; a downwardly disposed cam mounted on the agitator; an upwardly disposed cam mounted on the slide engageable with the cam on the agitator to raise the agitator as the slide is moved toward discharging position and to lower the agitator as the slide moves toward loading position, said slide having a longitudinal channel communicating with its passage and extended longitudinally thereof in the direction of movement toward the discharging position; and a division finger mounted on the end of the housing toward which the slide moves in traveling to discharging position extended longitudinally of the channel of the slide to a position disposed transversely of the passage when the slide is in discharging position.

3. A dispensing head comprising a substantially rectangular hollow housing having an upwardly disposed opening, opposite ends, substantially parallel sides defining a chamber therebetween, and a downwardly disposed discharge opening; a reservoir disposed above the housing adapted to deliver material to be dispensed into the upwardly disposed opening of the housing; a metering slide mounted in the housing for reciprocal movement longitudinally of the chamber between predetermined loading and discharging positions and having a passage of predetermined volume adapted to receive material from the reservoir when the slide is in loading position; an agitator pivotally mounted on an end of the housing in covering relation to the upwardly disposed opening of the housing and having a filling opening therethrough; a downwardly disposed cam mounted on the agitator; an upwardly disposed cam mounted on the slide engageable with the cam

on the agitator to raise the agitator as the slide is moved toward discharging position and to lower the agitator as the slide moves toward loading position, said slide having a longitudinal channel communicating with its passage and extended longitudinally thereof in the direction of movement toward the discharging position; and a division finger mounted on the end of the housing toward which the slide moves in traveling to discharging position extended longitudinally of the channel of the slide to a position disposed transversely of the passage when the slide is in discharging position.

4. A dentifrice dispensing head comprising a housing having a chamber therein, parallel side walls and first and second parallel end walls, each of said walls having upper and lower edges; an agitator plate having an end hingeably connected to the upper edge of the first end wall of the housing, an opposite end, a slot extending longitudinally of the plate a predetermined distance from its said opposite end and providing corresponding cam lobes on opposite sides of the slot extending downwardly into the chamber; a division finger extended longitudinally within the chamber a predetermined distance from the second end wall having an upwardly facing arcuate dentifrice guiding surface, an end which extends into the slot of the agitator plate, and a vertical keyway provided in the bottom thereof; a retainer plate connected to the lower edges of the side and end walls of the housing providing an elongated opening extended longitudinally of the housing; a leaf spring in connection with the plate adjacent to said hingeable connection and extending within the opening; a wedge-shaped distributing plate provided on the retainer plate at the end thereof opposite its hingeable connection to the housing; a metering slide having a vertical conical passage of predetermined size extending therethrough, a bottom surface, runner edges disposed on said bottom surface, parallel cam arms mounted on opposite sides of the passage, an upright key positioned forwardly of the passage, and a vertical trigger arm extended downwardly from the metering slide; and means for securing the retainer plate in position against the bottom edges of the walls of the housing with the metering slide being reciprocally received within the chamber so that the key is engaged in the keyway of the guide member, the runner edges rest on the inner surface of the retainer plate, the cam lobes rest on the cam arms, the trigger arm extends through the opening of the retainer plate, and the leaf spring presses against the trigger arm thus retaining the metering slide in abutment against the first end wall of the housing urging the metering slide into a position with its passage displaced from alignment with the openings of the agitator and retainer plates, and consequently requiring movement of the trigger arm against the spring to align said passage and the openings.

5. A dispensing head adapted to be disposed in material receiving relation beneath a reservoir of material to be dispensed, comprising a housing, a metering slide having a dispensing passage movable within the housing between predetermined loading and discharging positions, an agitator plate mounted on the housing within the reservoir above said metering slide in supporting relation to such material within the reservoir and providing a restricted filling opening therethrough for directing material into said passage in the metering slide when the latter is disposed in said loading position and being slidably engageable with said metering slide, and a division finger mounted in the housing in overlapping blocking relation between said opening in the agitator plate and said passage in the metering slide when the latter is disposed in said discharging position.

6. The dispensing head of claim 5 in which said agitator plate and said metering slide include respectively depending and upstanding pairs of spaced cam walls providing complementarily curved slidably engaging surfaces elevationally to agitate the agitator plate during said movement of the metering slide, said cam walls defining

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a substantially vertical relatively narrow material feeding passage between said opening in the agitator plate and the passage in the metering slide to guide such material into the passage prior to its discharge therefrom.

7. The dispensing head of claim 6 wherein the filling opening is centrally disposed within said agitator plate to provide spaced material support surfaces on opposite sides of the opening to agitate material supported thereon within the reservoir and to permit a relatively free flow of material gravitationally through said filling opening.

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## References Cited

## UNITED STATES PATENTS

884,186	4/1908	Meredith	-----	221—200
1,607,014	11/1926	Moak	-----	221—204
2,237,189	4/1941	McCormack et al.	-----	222—245
3,175,669	3/1965	Garvin	-----	221—202
3,191,803	6/1965	Hamilton	-----	221—200

WALTER SOBIN, *Primary Examiner.*