United States Patent [19]

Joiner

[11] **3,896,526**

[45] **July 29, 1975**

[54] **FRICTION BINDER HAVING VARIABLE CLAMPING FORCES**

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[73] Assignee: **Plan Hold Corporation,** Irvine, Calif.

[22] Filed: **Dec. 26, 1973**

[21] Appl. No.: **427,692**

[52] **U.S. Cl.** **24/67.1;** 24/251; 211/48

[51] **Int. Cl.²** **B42F 1/00;** A47F 5/08

[58] **Field of Search** ..... 24/67.1, 67 R, 251, 263 B, 24/260, 250; 211/46, 48

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Primary Examiner—Donald A. Griffin

Attorney, Agent, or Firm—Edward F. Jaros

[57] **ABSTRACT**

A friction binder device for vertical filing of sheet material clamped or held along an edge margin thereof. The friction binder includes clamp members relatively movable into clamping closed position and into open position for release of the material, the clamp members being operable to impose a variable clamping force responsive to and in accordance with the number of sheets of thickness of the material held. The variable clamping force is provided by a floating yieldable actuating means which includes a pivotally mounted lever arm having a cam surface acting against a spring means which is seated on a support member of channel section, in one example, or upon a portion of one of the clamp members in another example.

18 Claims, 20 Drawing Figures

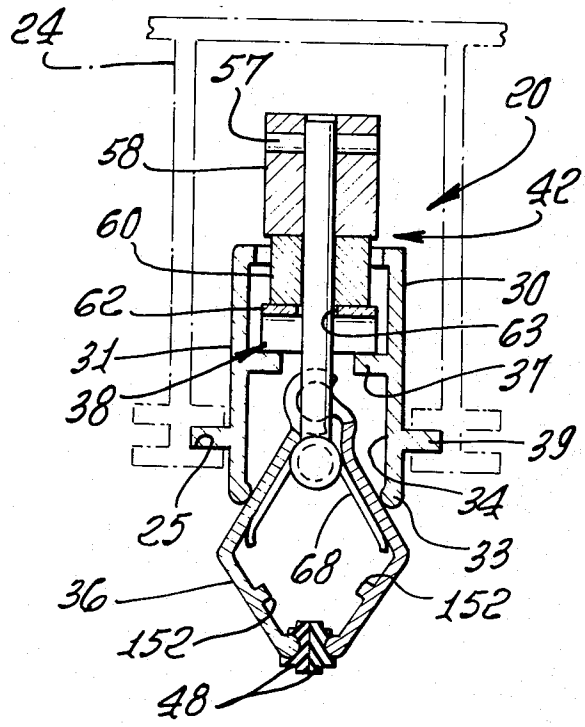


FIG. 1.

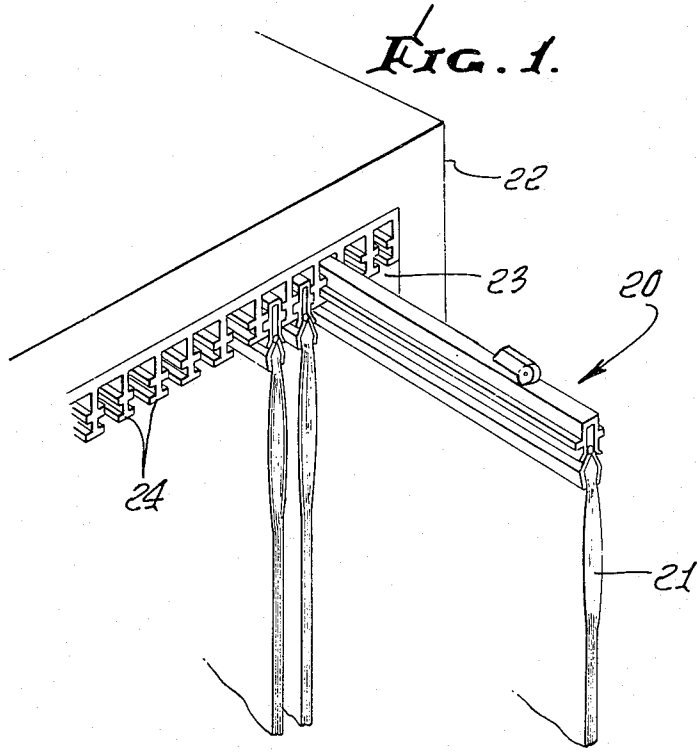


FIG. 14.

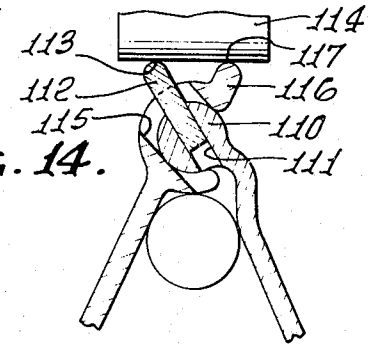


FIG. 15.

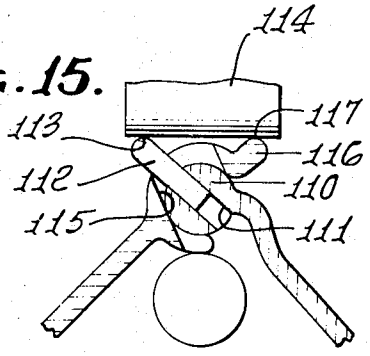


FIG. 16.

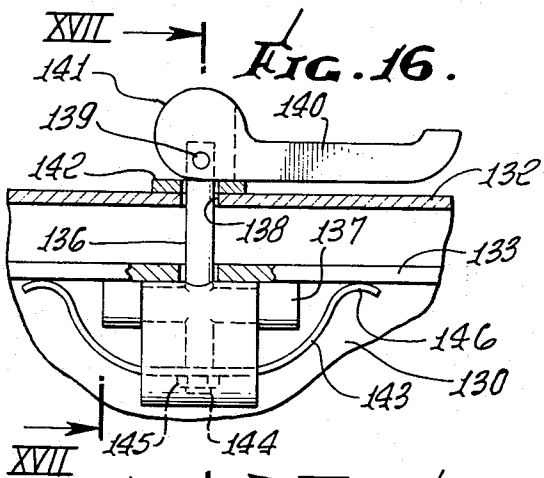


FIG. 18.

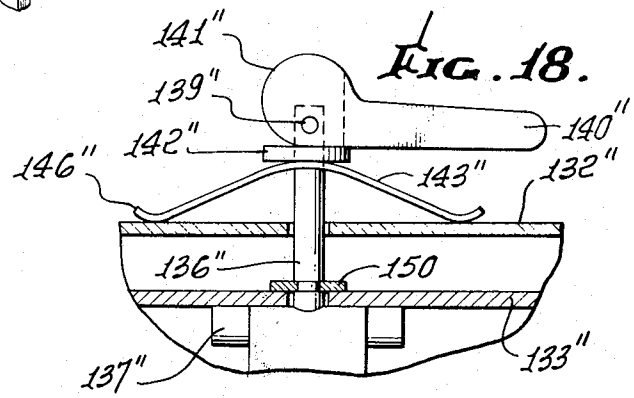


FIG. 19.

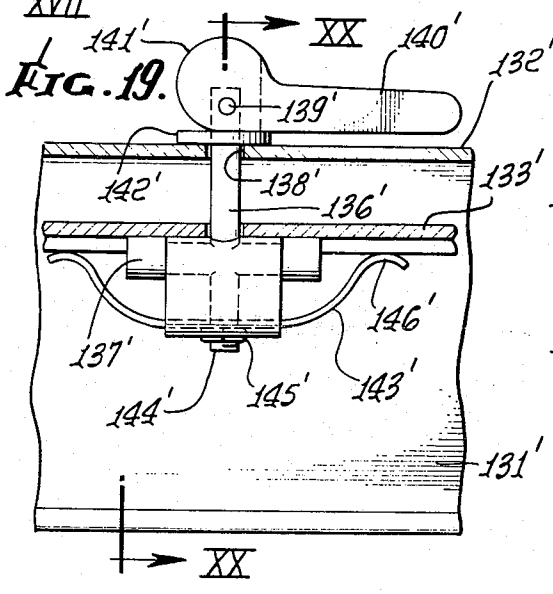


FIG. 17.

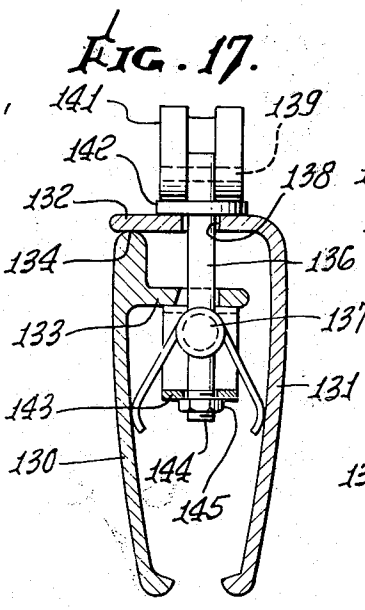


FIG. 20.

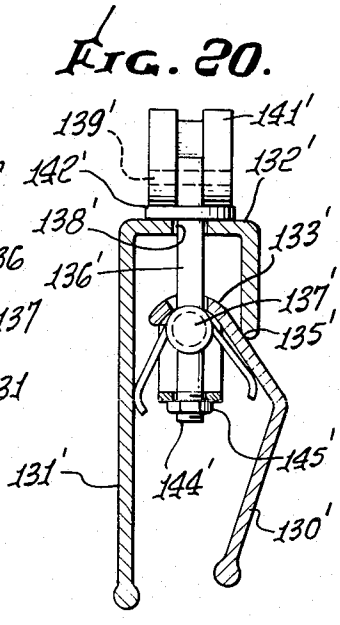


FIG. 2.

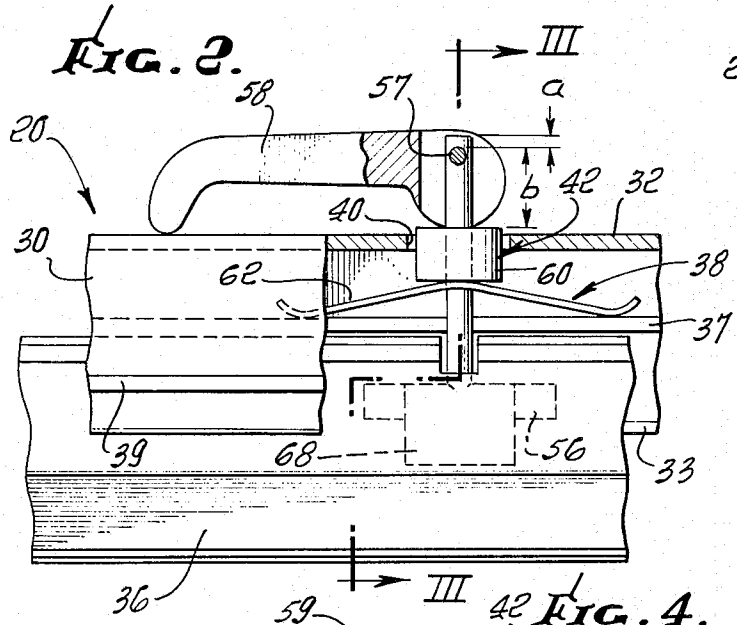


FIG. 3.

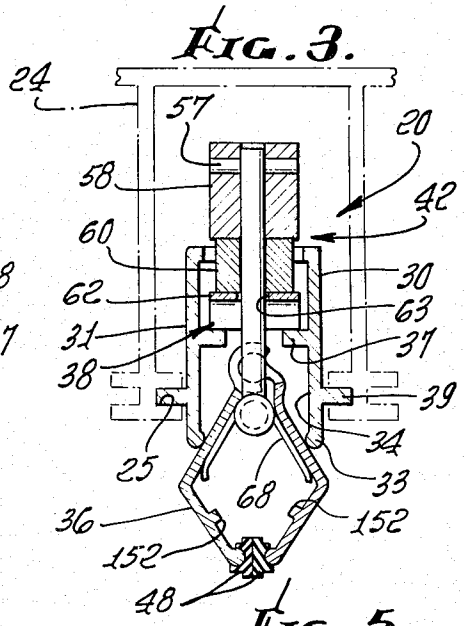


FIG. 4.

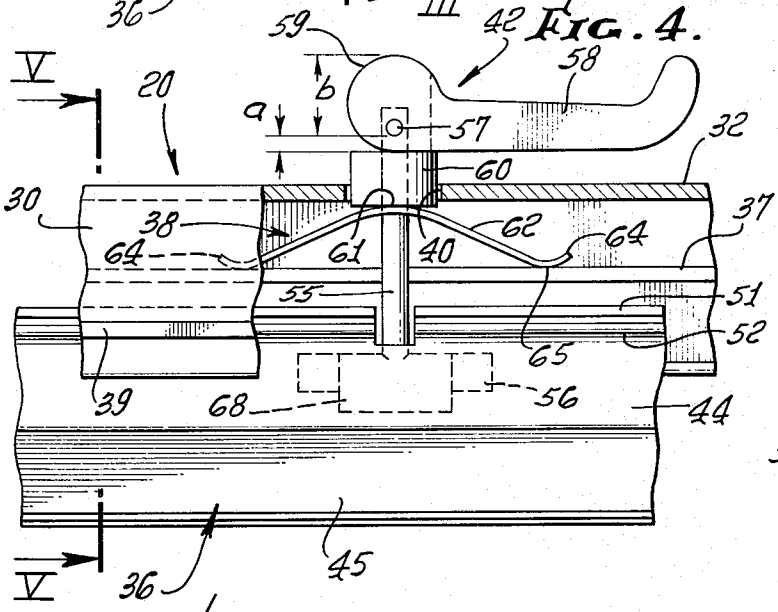


FIG. 5.

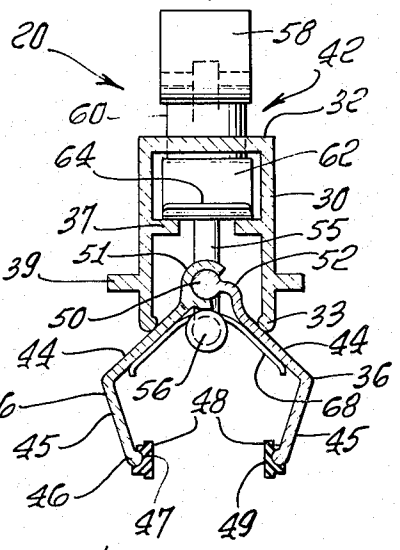
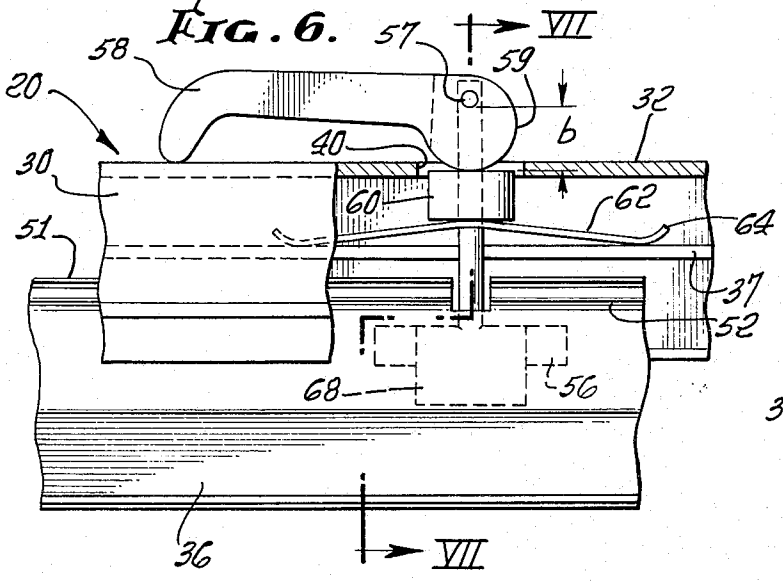


FIG. 6.



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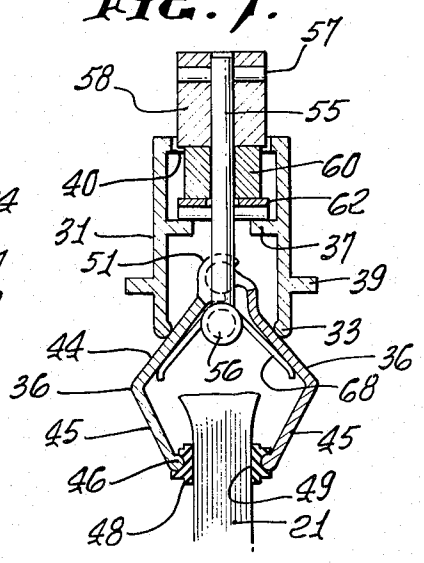

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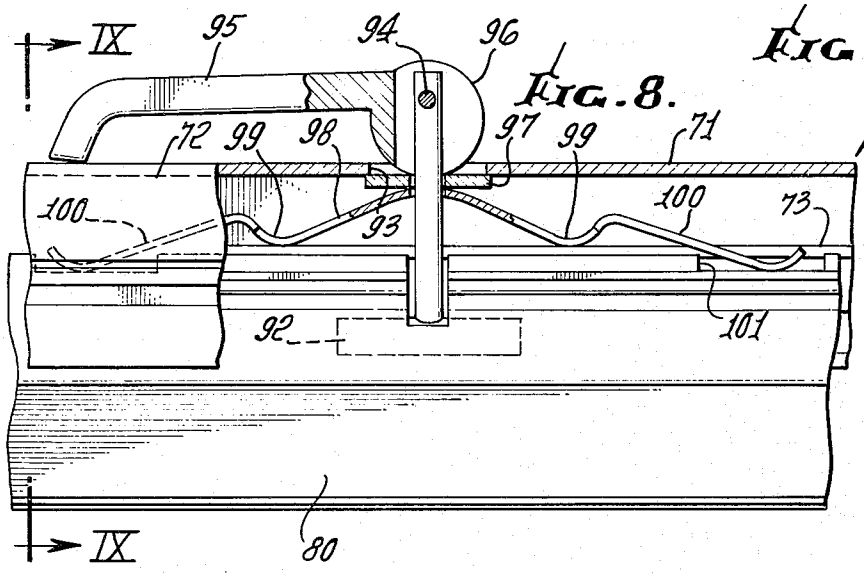


FIG. 9.

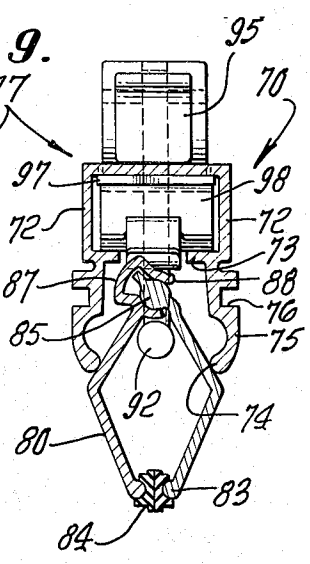


FIG. 10.

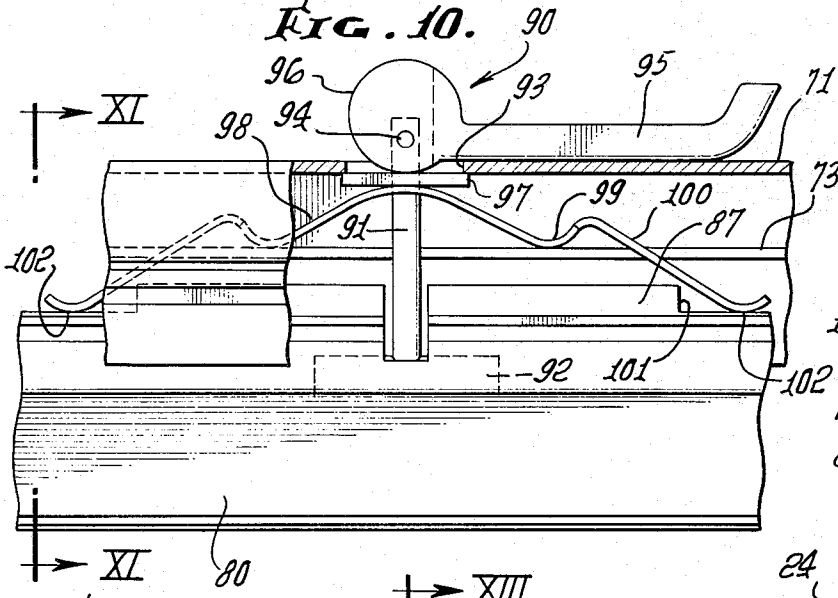
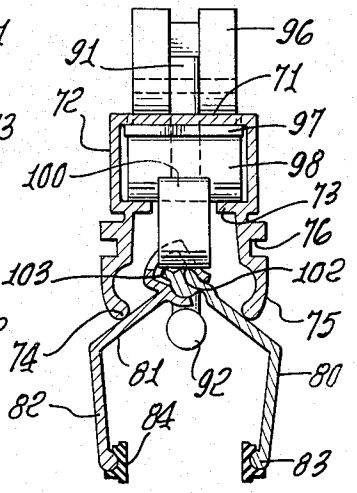


FIG. 11.



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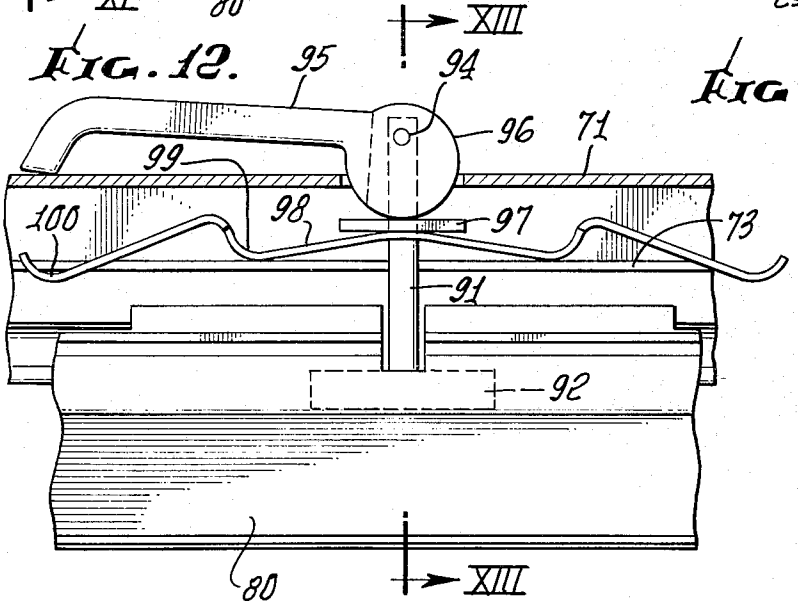
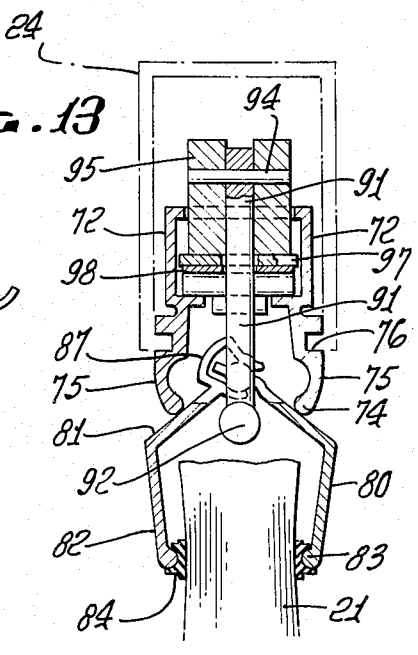


FIG. 13



FRICTION BINDER HAVING VARIABLE CLAMPING FORCES

BACKGROUND OF INVENTION

There are many advantages in vertically filing sheet material of large size such as architectural and engineering drawings, construction plans, maps, swatches of fabric, advertising layouts, and the like. In such vertical filing, edge margins of one or more sheets are gripped and held by clamp members of a binder device. Such friction binder devices have generally included a three piece construction in which a generally U section channel support member provides an opening in which a pair of longitudinally extending clamp members are moved inwardly and outwardly by a bolt type actuating means to cause clamping or unclamping of the clamp members.

Such prior proposed friction binder devices are described in several United States Letters Patent namely, U.S. Pat. Nos. 2,869,210, 2,990,961, 1,911,277, **3,221,892,** and 3,729,099. Two piece friction binder constructions in which two angle section clamp members are arranged with respect to an actuating means for clamping and unclamping the clamp members are described in U.S. Pat. Nos. 3,069,737 and 3,364,528.

In the prior binder constructions mentioned above and using both three piece and two piece arrangements, the actuating means for the clamp members has included a bolt and nut assembly in which the nut, which may be in the form of a wing nut, is rotated on the threads of the bolt to impart a clamping force to the jaws and to the sheet material to be held thereby. Such hand tightening of wing nuts was relatively time consuming, became more difficult as the number of sheets of material were increased and were required to be held by the clamp members. In some instances the forces required to satisfactorily hold a large number of sheets of material became so great that tightening of the wing nuts by hand was not adequate. Moreover, such clamping forces applied at only two or three locations over a relatively long length of binder produced lateral bending of the clamp members.

In another type of prior proposed clamp construction U.S. Pat. No. 1,397,930, jaw members were loosely held by a ring at one end, the sectional configuration of the jaw members at the other end were arcuate in form to improve the grasp of the jaw members on margins of paper inserted therebetween, and a lever type actuating means was arranged laterally of the jaw members and acted on the sides of the jaw members. Such a prior proposed clamp was not adapted for use with other like clamps when the clamped material was to be supported vertically in a cabinet or other enclosure where clamps are arranged in close relation to facilitate storage of a maximum amount of material.

SUMMARY OF INVENTION

The present invention relates to a novel friction binder which avoids many of the disadvantages of the prior proposed constructions and provides convenient rapid clamping or releasing of sheet material in minimum and maximum quantities.

The present invention particularly relates to a floating yieldable means for applying a variable force to clamp members whereby adequate force is available to hold one sheet of material and such force is increased as the number of sheets of material increase so as to adequately clamp and hold a maximum number of sheets of material.

An object of the invention is to provide a friction binder device having variable force applying means wherein application of maximum clamping force is accomplished as readily as application of minimum clamping force, such changes in force application being facilitated by a cooperable spring member and a lever arm having a cam surface coacting with the spring force.

Another object of the present invention is to provide a friction binder device having a novel clamping force applying means so constructed and arranged that the force to be exerted by the operator is minimized while adequate clamping forces are imparted to the clamp members.

Another object of the invention is to provide in either two or three part binder devices means for distributing clamping forces over an increased clamping area.

A still further object of the present invention is to provide a friction binder for vertical filing wherein changes in material section and coacting surfaces of parts of the binder are so designed and constructed as to reduce the cost of material and thereby provide a binder inexpensive to manufacture and effective in operation.

A still further object of the invention is to provide a friction binder construction in which certain members of the binder such as the support member and jaw members are structurely reinforced to minimize lateral deflection of the members.

A still further object of the invention is to disclose and provide a friction binder construction which is readily adapted to be installed in a cabinet with relatively closely adjacent like binder constructions.

Another object of the invention is to provide a friction binder construction utilizing leaf-type spring means whereby such spring means is cooperable with the clamp members for opening and closing the clamp members as well as for facilitating the imparting of a variable clamping force to the clamp members.

Other objects and advantages of the present invention will be readily apparent from the following description of the drawings in which several exemplary embodiments of the invention are shown.

IN THE DRAWINGS

FIG. **1** is a fragmentary front perspective view of a vertical filing cabinet adapted to receive and hold friction binders embodying the present invention.

FIG. **2** is an enlarged fragmentary, partly in section, side elevational view of a friction binder provided with a force applying means of this invention.

FIG. **3** is a transverse sectional view taken in the planes indicated by line III—III of FIG. **2.**

FIG. **4** is a fragmentary side elevational view partly in section of the binder shown in FIG. **2** the force applying means being shown in clamp open position.

FIG. **5** is an enlarged sectional view taken in the transverse plane indicated by line V—V of FIG. **4.**

FIG. **6** is a side elevational view of the binder shown in FIG. **2,** partly in section, showing the clamp members holding a selected thickness of sheet material.

FIG. **7** is a sectional view taken in the transverse plane indicated in line VII—VII of FIG. **6.**

tive loose sliding movement of the spring relative to the pin member. Outer ends **64** of leaf spring **62** may be curved upwardly and bear upon interior ledge portions **37** as at **65.**

In this embodiment of the invention a spring member **68** may be carried by head **56** of the pin member **55** to bias clamp members **36** outwardly against the beaded edges **33** of side walls **31.**

In operation of the friction binder **20** of this embodiment it should be noted that in closed position the exterior surfaces of the upper leg portions **44** of the clamp members **36** pressure engage the beaded longitudinal edges **33** of the channel member at approximately the lower one-third of the width of the leg portion **44** and relatively adjacent the vertex of the angle of the clamp member. The lever arm **58** is in a position where maximum throw B of the eccentric is between the pivotal connection of the pin **57** with the lever arm and the follower **60.** Thus the spring **62** is under compression between the follower and the ledge portions **37** of the channel support member.

When the lever arm **58** is rotated approximately **180** degrees to the position shown in FIG. **4** it will be apparent that the clamp members **36** are in open position and the line of pressure engagement of the leg portions **44** with the beads **33** has moved toward the hinge connection of the clamp members. The follower **60** has been urged upwardly through the opening **40** in the top wall of the channel support member and the leaf spring **62** has returned to its normal relaxed condition. The minimum eccentric throw A now lies between the pivot pin **57** and the cam follower. In such clamp member open position one or more sheets of material may be readily inserted between the shoes **48.** When the lever arm **58** is moved through **180** degrees to clamp member closed position, it will be apparent that the shoes **48** can move toward each other only to the extent permitted by the thickness of the sheet material and the movement of the jaw members relative to the beads **33** is limited (FIG. 7). During such movement of the lever arm **58** through **180** degrees, the follower **60** is depressed by the cam face **59,** the leaf spring **62** compressed and a pressure force exerted by the clamp members against the sheet material is determined by the resistance of the spring **62,** the throw B of the lever arm **58,** and the position of the pressure line of contact of the beads **33** with the clamp members **36.**

Thus regardless of the number of sheets of material between the clamp members **36,** the floating cam follower **60** on the yieldable resilient spring **62** will self adjust to provide a variable pressure force against one or more sheets of material. When a maximum number of sheets of material are included between the clamp members it will be apparent that a maximum force may be exerted by the force applying means for retaining the maximum number of sheets of material. Even though a maximum force is being exerted on the sheet material, the movement of the lever arm **58** from open to close position is readily manually accomplished because of the length of the arm **58** and the configuration of the cam face **59.**

In FIGS. **8 – 13** inclusive, a modification of the present invention is shown. For purposes of brevity and clarity parts thereof similar to the prior embodiment will be only briefly described.

A channel section support member generally indicated at **70** includes a top wall **71,** side walls **72,** interior ledge portions **73** and a channel opening **74** defined by lower side wall portions **75** of different configuration than the corresponding side walls of the prior embodiment. Each side wall portion **75** includes a longitudinally extending groove **76** in which a rib on a guide member in a cabinet may slide for supporting the friction binder generally indicated at **77.** The lower longitudinal edge of portion **75** has an arcuate surface and may be of somewhat thicker metal section. The width of opening **74** may be slightly less than the space between the interior wall surfaces of walls **72** above ledge portions **73.**

Clamp members **80** include an upper portion **81** and a lower portion **82** in angular relation with an included angle therebetween of approximately 120°. The width of the upper and lower leg portions in this example is approximately the same. The longitudinally extending edge bead **83** at the bottom of each lower leg portion **82** supports a pressure shoe member **84** in a manner similar to that described in the prior example. The upper leg portions **81** are hingedly connected along their upper longitudinal edges in a manner somewhat similar to the prior example but differs therefrom in that the generally circular section edge **85** of one portion **81** is provided with a projection **86** which extends within an internal chamber formed by an enlarged intermediate portion **87** of a somewhat C section edge portion **88** of the other upper leg portion **81.** The C section portion **88** receives the circular edge portion **85** as in the prior embodiment. The intermediate enlargement portion **87** provides a chamber for the projection **86** to permit the desired relative movement of the clamp members **82.**

The force applying means **90** of this embodiment includes a T-headed bolt or pin member **91** having head **92** underlying the hinge connection. Pin member **91** extends between ledge portions **73** and through a port **93** in top wall **71** for pivotal connection at **94** with a lever arm **95.** Arm **95** includes a cam face **96** generated about pivotal connection **94** to provide minimum and maximum eccentric throw over angular rotation of the arm of 180°. Cam face **96** bears upon a relatively thin cam follower **97** located beneath top wall **71** and having an external size underlying the edge margins of opening **93** to prohibit movement of the follower **97** through the opening. Follower **97** seats upon an upper convex portion of a leaf-type spring **98** having central portions **99** seated upon ledge portions **73.** Outwardly of the central portions **99** the leaf-spring member **98** includes spring fingers **100** which extend through an opening **101** in the C shaped section of upper leg portion **81** for seating engagement as at **102** and **103,** FIG. **9.** Spring pressure at points **102** and **103** on opposite sides of the hinge axis of the clamp members and on the respective clamp members serves to bias the clamp members into open position. Thus need for spring member **68** of the prior embodiment is obviated.

In operation of the friction binder **77** shown in FIGS. **8 – 13** inclusive it will be readily apparent that in closed position, FIGS. **8** and **9,** the leaf spring **98** biases the cam follower **97** to its uppermost position and the location of the lever arm **95** is such that the maximum throw of the cam face **96** is between the pivotal connection **94** and the hinge axis of the clamp members. When the lever arm **95** is thrown **180** degrees about pivotal connection **94** as shown in FIGS. **10** and **11** the configuration of the central portion of the leaf spring

98 remains essentially the same in that the cam follower 97 is still pressed against the edge margins of opening 93. However, in clamp member open position the spring fingers 100 extend further downwardly because of the downward movement of the hinge axis of the clamp members relative to the channel support member and bear against the spring pressure points 102 and 103 to cause the clamp members to open as shown in FIG. 11.

It is important to note that in FIG. 9 the edge beads 74 of the side walls bear against the exterior surface of the upper leg portion 81 along a line more closely adjacent to the vertex of the angle of the portions 81, 82 than in the prior embodiment. Thus in this second embodiment of the invention the fulcrum line of pressure contact between the edge bead and the exterior surface of upper leg portion 81 is at a more effective mechanical location for transmitting pressure forces to the clamp members. As shown in FIG. 11 in fully open position the edge beads 74 are located at approximately the mid-portion of the width of the upper leg portion.

The relative position of the force applying means of this embodiment of the invention shown in FIGS. 12 and 13 is important to note, when a thickness of sheet material representing maximum thickness or maximum number of sheets to be held. In such position, clamp members 80 are forced to lowermost position with respect to the channel support member 70 by locating the maximum throw of the cam force 96 below the pivotal connection 94 and with lever arm 95 located as shown in FIG. 12. The cam face 96 projects through opening 93 and depresses cam follower 97 to press the central portion of the leaf spring downwardly with respect to the ledge portions 73 and into a more flattened configuration. In such depressed condition of the central portion of the leaf spring, it will be apparent that the leaf fingers 100 are disengaged and spaced from the pressure points 102, 103 of the clamp members and therefore do not counteract the biasing force exerted by the leaf spring against the cam follower 97, cam face 96, pin member 91 and the hinging connection of the clamp members 80. Thus the pressure exerted against the maximum thickness of sheets is directly correlated to the spring pressure exerted by the leaf spring and to the lever action afforded by the engagement of the clamp members with the edge beads of the side walls of the support member.

It will thus be apparent from the description of the above two embodiments of the invention that the force applying means provides a yieldable resilient application of force to the clamp members for effectively retaining or holding one thin sheet of material or a sufficient maximum force to retain a maximum number of sheets. Moreover, the application of such force is easily accomplished by the pivotal movement of the lever handle about its pivotal connection through an angle of 180°. In this respect while the description has referred to a swinging arc of the lever arm of 180° it will be understood by those skilled in the art that such an arc may be less than 180° depending upon the manner in which the cam face is generated about the pivotal connection of the lever arm to the pin member. In addition, in some instances it may be desirable to so generate the cam face that when the lever arm reaches its home position in clamping relation, the contact of the cam face with the pressure follower will be slightly off or beyond center so that, for example, movement through the last few degrees of movement the lever arm will be in effect in a locked position.

In FIGS. 14 and 15 fragmentary modifications are illustrated of the hinge connection of the embodiment of the invention shown in FIGS. 8 – 13 inclusive. In FIGS. 14 and 15 the essential arrangement of a part circular beaded edge section receivable within an essentially C section configuration of the other member is illustrated. However, in this modification the hinge beaded edge 110 may be provided with a diametrical slot 11 for reception therein of a projecting member 112 to provide a spring pressure point 113 with a finger 114 of a leaf spring similar to the configuration of spring 98. The C section edge portion is provided with an opening 115 through which the projection 112 extends and is also provided with an upturned edge 116 to provide a spring pressure point 117 with the spring finger 114. Relative pivotal movement of the two clamp members may be limited not only by the amount of displacement of the pin member but also by the travel of the projection 112 in the opening 115.

The modifications s of the invention described above relate to a three piece friction binder construction, namely those having a channel support member and two clamp members. As shown in U.S. Pat. Nos. 3,364,528 and 3,069,737 owned by the assignee of the present invention two piece clamp members comprising essentially two angle section clamp members arranged with a portion of one angle clamp member within a portion of the other angle clamp member utilize an actuating means similar to the bolt and nut assembly of the three piece friction binders. The yieldable resilient force applying means of the present invention may be readily adapted to such two piece binder constructions as shown in FIGS. 16 – 20 inclusive.

For brevity, the embodiment shown in FIGS. 19 and 20 will be described together with the embodiment shown in FIGS. 16 and 17, and parts similar thereto in function will be given the same reference numerals with a prime sign in FIGS. 19 and 20.

In each of these examples jaw members 130, 131; 130′ 131′ include overlapping portions 132, 133; 132′, 133′ having a fulcrum contact line 134, 135′ laterally offset from the longitudinal center of the assembled jaw members. In place of the prior nut and bolt assembly which extended through the overlying portions, a pin member 136, 136′ may extend through both overlying portions 132, 133; 132′, 133′ and may have a suitable head 137, 137′ bearing against the inner bottom surface of portions 133, 133′. Pin member 136, 136′ extends through an opening 138, 138′ in the overlying portion 132, 132′ for pivotal connection at 139, 139′ with a lever arm 140, 140′ having a cam face 141, 141′ generated in a manner similar to that described in the prior embodiments of this invention. Cam face 141, 141′ acts against a follower 142, 142′ which in FIGS. 17 and 20 may be positioned between the overlying portion 132, 132′ and the pivotal connection. In these examples, a leaf-type spring member 143, 143′ is held at its central portion by an extension 144, 144′ of the pin member 136, 136′ below head 137, 137′ by a suitable nut 145, 145′. Ends 146, 146′ of the leaf spring 143, 143′ bear against the bottom surface of the inner underlying portion 133, 133′ of jaw member 130, 130′ to exert a spring biasing force against the portion 133, 133′ to urge the jaw member pivotally about its ful-

crum line of contact toward the upper overlying portion **132, 132'**. The central portion of spring **143** may be sufficiently elongated to clear head **137** of the pin member **136** or the head **137, 137'** may be slightly modified in configuration to accommodate the central portion of the leaf spring **143, 143'**.

It will be apparent that when the lever arm **140, 140'** is swung through 180° and pivotal connection **139, 139'** is spaced a maximum distance from the overlying clamp member portion **132, 132'** that the overlying portions **132, 132'** and **133, 133'** are drawn together about the fulcrum line contact **134, 134'** into closed position. Since leaf spring **143** normally biases the clamp members into closed position, it will be understood that a spring pressure force is applied to the edges of the jaws sufficient to hold even a single sheet of material. When a maximum number of sheets are held between the jaw members it will be apparent that the spring force exerted by leaf spring **143** will be greater and proportional to the deflection of the leaf spring in open position of the jaw members.

In the examples of the invention shown in FIGS. **16, 17, 19** and **20** the leaf spring was applied to the pin member in a protected concealed position between the jaw members **130, 131.** In FIG. **18** a different embodiment of this arrangement is illustrated in which the pin member **136''** includes head **137''** and a lock washer **150** on the opposite side of overlying clamp portion **133''** so that the pin member **136''** is relatively immovable with respect to one of the jaw members. Pin member **136''** extends through an opening in the upper overlying clamp member portion **132''** and extends therebeyond for pivotal connection at **139''** with a lever **140''** having a cam face **141''**. Lever **140''** is seated upon a washer **142'**. Between washer **142''** and the overlying portion **132''** is provided a leaf spring **143''** having upturned ends **146''** seated on the upper surface of portion **132''**.

It will be apparent that the two piece binder construction fragmentarily illustrated in FIG. **18** will operate in essentially the same manner as the binder shown in FIGS. **16, 17, 19** and **20** in that the leaf member **143''** exerts a resilient biasing spring force to normally close the jaw members and that when the lever **140''** is thrown to jaw closed position, the spring **143''** will yieldably exert a spring force to maintain the jaw members in closed relation whether a single or a maximum number of sheets are held by the clamp members.

It will be readily apparent to those skilled in the art that in each of the embodiments described above, one or more sheets of material may be gripped under pressure by the clamp members. In each example, at least one of the clamp members provides a fulcrum contact on an upper surface thereof with either a third member such as the U channel shaped member or a portion of the other clamp member as indicated in the last embodiments of the invention. Actuating means for moving the clamp members into open or closed position are provided in the planar zone defined by the clamp members so that clamp members may be moved into close proximate relation in a supporting bracket system or a supporting cabinet system. The actuating means operable in such a planar zone provides in each embodiment a floating yieldable resilient means which normally biases the clamp members into gripping engagement and in which the gripping force acting on the sheets of material is correlated to the number of sheets of material being clamped in accordance with the amount of deflection of the spring member.

It will be understood that while the embodiments of the invention described above illustrate one actuating means on a friction binder, it will be understood that depending upon the length of the friction binder, one or more of such actuating means may be provided along the length of the binder the spacing between such actuating means being dependent upon the material to be held and the required spring biasing force to hold and retain a maximum number of sheets of material between the clamp members. It may be desirable to reinforce and strengthen the angle section clamp members as by extruding such clamp members with internal longitudinally extending reinforcement ribs **152** (FIG. **3**). It may also be desirable to extrude such clamp members with longitudinally extending reinforcing ribs in other locations such as in the upper portion **41** of the clamp members.

In the embodiment of the invention shown in FIGS. **8 – 13** the channel recesses **76** (FIG. **9**) provide way means for sliding the friction binder into a cabinet as illustrated in FIG. **1** and wherein the configuration of the support members **24** may be slightly modified in cross section as indicated in phantom lines in FIG. **13.**

It will be understood that various modifications and changes may be made in the examples of the invention described above and all such changes and modifications coming within the spirit of this invention and within the scope of the claims appended hereto are embraced thereby.

I claim:

1. In a device for vertical filing of sheet material in which an inverted generally U-shaped channel provides longitudinal edges bearing against longitudinally extending clamp members hinged together within the U-shaped channel, the provision of:

means to apply a variable force to said clamp members to move the clamp members into closed position to secure one or more of said sheets of material,

said force applying means drawing the clamp members further into said channel member,

said force applying means including yieldable resilient means for transmitting a variable pressure force responsive to the number of sheets to be held.

2. In a filing device as stated in claim **1** wherein said force applying means includes

a connector member extending through said channel member for connection to said clamp members,

a lever arm pivotally mounted on said connector member,

said lever arm being movable between clamp open and clamp closed position, and

said connector member being biased by said yieldable resilient means.

3. In a vertical filing device the combination of:

a support member including a longitudinally extending opening and spaced parallel ledge portions inwardly of said opening;

a pair of longitudinally extending clamp members of angle section hinged together along longitudinal edges received within said opening,

said clamp members having surfaces engagable with edges of said openings;

a spring means seated on said ledge portions and exerting a spring biasing force in a direction away from said opening;

and means associated with said spring means and said clamp members whereby said spring means normally urges said clamp members into closed position.

4. In a filing device as stated in claim **3** wherein said last mentioned means includes a follower seated on said spring means,

an opening in said support member opposite said spring means;

a lever arm having a surface cooperable with said follower,

and means connecting said lever arm and said clamp members for moving said clamp members into open and closed position.

5. In a device as stated in claim **3** including

spring means between said clamp members for urging said clamp members apart into engagement with said support means.

6. In a device as stated in claim **3** including a spring means having an extended spring finger bearing against hinged longitudinal edge portions of said clamp members for biasing said clamp members apart.

7. In a friction binder for filing of sheet material in a vertical planar zone in which a pair of opposed clamp members are relatively movable into closed position for gripping one or more sheets of material and into open position for releasing sheet material held thereby, the provision of:

means providing a fulcrum contact on the surface of at least one of said clamp members;

and a floating yieldable actuating means operable in said planar zone and for moving said clamp members into gripping engagement with said sheet material in which the gripping force is correlated to the number of sheets of material being clamped.

8. In a friction binder as stated in claim **7** wherein said floating yieldable actuating means includes

a pin member coacting with said one of said clamp members;

a lever arm pivotally connected to the other end of said pin member;

said lever arm having a cam surface of changing radius about said pivotal connection;

and spring means between ends of said pin member and subject to deflection upon pivotal movement of said lever arm for applying a variable pressure to said one clamp member.

9. In a friction binder as stated in claim **7** herein, at least one of said members includes an internal ledge portion cooperable with said actuating means.

10. In a device for vertical filing of sheet material in which an inverted generally U-shaped channel provides longitudinal edges bearing against longitudinally extending clamp members hinged together within the U-shaped channel, the provision of:

means to apply a variable force to said clamp members to move the clamp members into closed position to secure one or more of said sheets of material,

said force applying means drawing the clamp members further into said channel member,

the force applying means being responsive to the number of sheets to be held,

said force applying means including

a lever arm supported from said channel member,

a pin member pivotally connected to said lever arm and extending through said channel member and having one end connected to said clamp members,

and yieldable means between said connections for transmitting a variable pressure force to said clamp members in response to the thickness of the material held by said clamp members.

11. In a filing device as stated in claim **10** wherein said means between said connections includes a spring means having a seat on said channel member,

a follower member movably mounted on said pin member,

said follower member having a surface bearing against said spring means and another surface bearing against said lever arm.

12. In a device for vertical filing of sheet material in which an inverted generally U-shaped channel provides longitudinal edges bearing against longitudinally extending clamp members hinged together with the U-shaped channel, the provision of:

means to apply a variable force to said clamp members to move the clamp members into closed position to secure one or more of said sheets of material,

said force applying member drawing the clamp members further into said channel member,

the force applying means being responsive to the number of sheets to be held,

said channel including longitudinally extending internal ledge portions cooperable with said force applying means.

13. In a filing device for releasably holding edge margins of one or more sheets of material in a clamping zone, the combination of:

clamping means including at least one clamp member to exert a pressure force against sheet material in said clamping zone;

force applying means operably associated with said clamping means to exert said pressure force;

said force applying means including engagement means for said clamp member, and

yieldable resilient means operably biasing said clamp member toward sheets of material in said clamping zone.

14. In a device as stated in claim **13** wherein said force applying means includes

a lever arm cooperably connected with said engagement means and with said resilient means.

15. A device as stated in claim **14** wherein

said lever arm includes a cam surface, and

said engagement means includes a cam follower means engageable with said cam surface.

16. A device as stated in claim **13** wherein said clamp member includes

a longitudinally extending clamp edge, and

a longitudinal pressure member having a pressure face and having rotational adjustment on said edge to direct said face toward said sheet material during clamping.

17. In a device as stated in claim **16,** wherein

said pressure face is planar and minimizes splaying of sheet material in the clamping zone.

18. In a device as stated in claim **13** wherein said resilient means includes

a spring means having a spring portion bearing against said clamping means to urge said clamping means to open position.

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