F. COATES.

MACHINE FOR SECURING END CLOSURES IN VESSELS.

APPLICATION FILED SEPT. 25, 1920.

1,384,049.

Patented July 12, 1921.

2 SHEETS—SHEET 1.

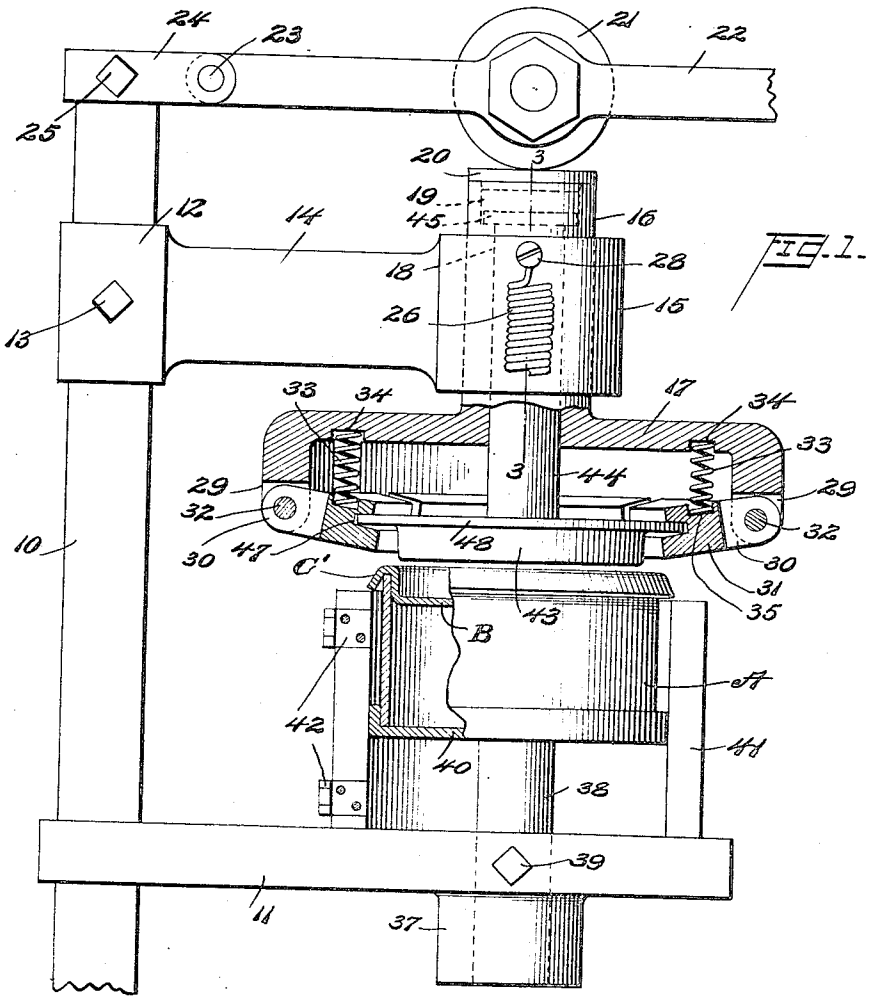


FIG. 1.

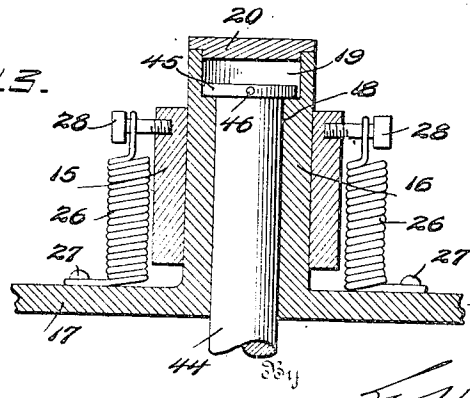


FIG. 2.

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2 SHEETS—SHEET 2.

FIG. 3.

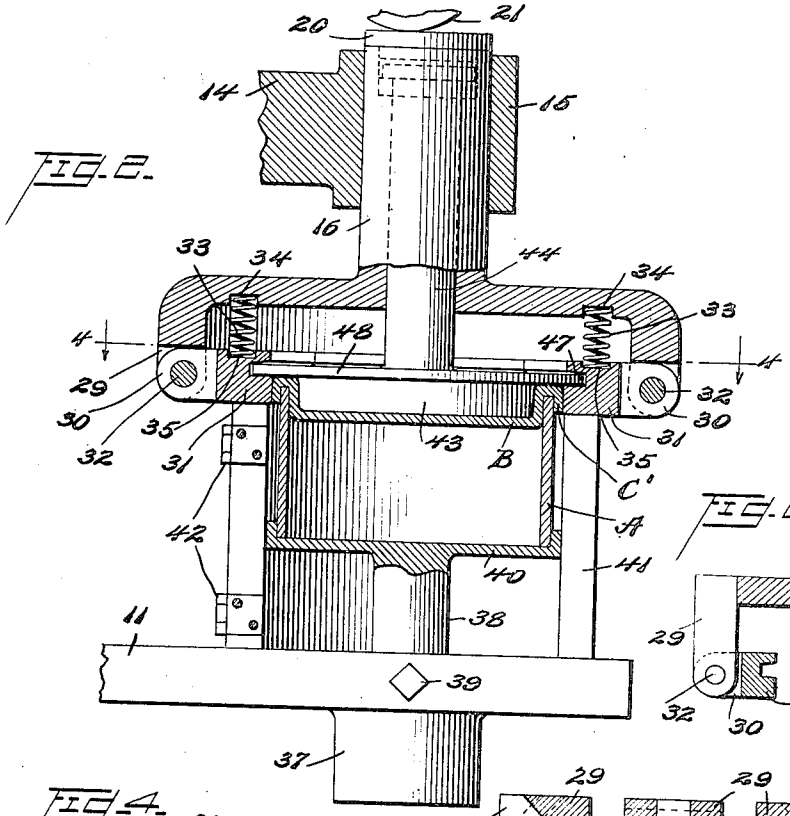
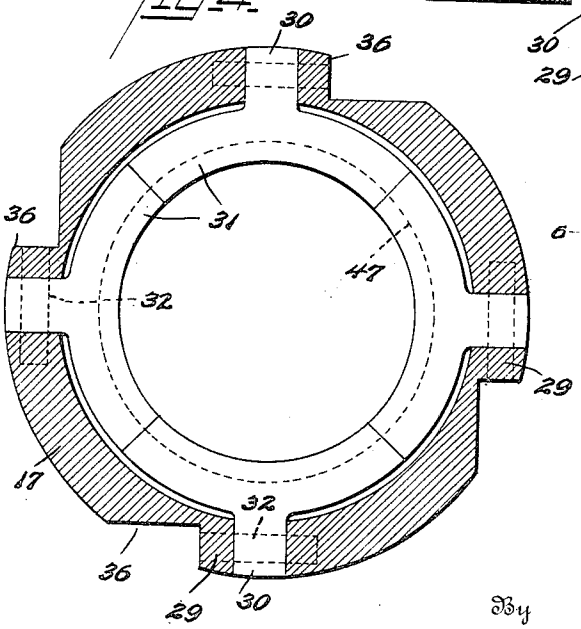


FIG. 6.

FIG. 4.



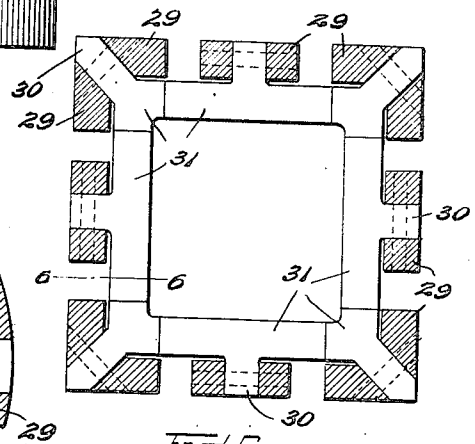


FIG. 5.

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UNITED STATES PATENT OFFICE.

FREDERICK COATES, OF WYOMING, OHIO, ASSIGNOR TO FEDERAL PRODUCTS COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

MACHINE FOR SECURING END CLOSURES IN VESSELS.

1,384,049. Specification of Letters Patent. Patented July 12, 1921.

Application filed September 25, 1920. Serial No. 412,835.

To all whom it may concern:

Be it known that I, FREDERICK COATES, a citizen of the United States, residing at Wyoming, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Machines for Securing End Closures in Vessels, of which the following is a specification.

This invention relates to the manufacture of cartons such as are made of paper and the like and which have a body portion provided with top and bottom heads, one or both heads being fixed to the body by glue or paste.

More particularly the invention relates to a machine for securing end closures in vessels of the character named.

It is well recognized that strength is given the ends of cartons of this class if the closures or heads are so formed as to project into the body, or technically speaking, are "bumped" inwardly. In such cases where the closures are secured by glue or paste a head may consist of a flat disk like central portion surrounded by a rim which bears against the inside of the body and is crimped over to engage the outside of the body.

One important object of the present invention is to provide a simple machine of improved construction for applying such heads to carton bodies.

In preparing heads of the above described character the crimping over of the rim is partially effected in the manufacture of the head but the crimped over portion of the rim is left flaring outwardly so that the head may more readily be applied to the body.

A second important object of the invention is to provide a machine having simple and improved means for forcing this flaring portion inward against the carton body.

Pressure applied to the outside of such heads around their periphery tends to distort the head unless means are provided to maintain its form.

A third object of the present invention is to provide a novel arrangement and operation of supporting die for the bumped portions of such heads whereby distortion or collapse of the head will be prevented.

With the above and other objects in view, as will be hereinafter apparent, the invention consists in general of certain novel details of construction and combinations and arrangements of parts hereinafter fully described, illustrated in the accompanying drawings and specifically claimed.

In the accompanying drawings like characters of reference indicate like parts in the several views, and:—

Figure 1 is a side elevation partly in section of a machine constructed in accordance with this invention, the parts being shown in the positions assumed before operating on a carton.

Fig. 2 is a partial side elevation, also partly in section, with the parts in the positions assumed when the operating on a carton is complete.

Fig. 3 is a vertical section through the upper part of a certain plunger used in connection with other devices to form the invention, the section being taken on the line 3—3 of Fig. 1.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is a view similar to Fig. 4 but disclosing a modification of the portion of the machine there shown.

Fig. 6 is a section on the line 6—6 of Fig. 5.

It is to be understood that the embodiment of the invention illustrated in the drawings and now to be described is merely one of many ways in which the invention may assume concrete form. This embodiment is therefore to be taken as simply typical of a variety of forms which the invention may take.

In this embodiment there is provided a standard 10 which may be secured to any suitable foundation such as a floor or table. This standard carries a table 11 and on the standard above the table is a slidable sleeve 12 held in adjusted position on the standard by means of a set screw 13. Projecting from the sleeve 12 is an arm 14 carrying at its outer end a sleeve 15 wherethrough extends reciprocably the stem 16 of a plunger having a head 17. This stem is hollow for purposes hereinafter to be described, being provided with an axial opening 18 having an enlarged upper end 19 normally closed by a cap 20. Resting on the cap 20 is a roller 21 which is revolubly mounted on a lever 22. This lever has one end pivoted as at 23 to a collar 24 mounted on the upper part of the standard 10 and held in adjusted position by a set screw 25. Thus the construc-

tion is such that by pressing the free end of the lever downwardly the plunger is depressed. In order normally to hold the plunger raised tension springs 26 have their lower ends connected to the head as at 27 and their upper ends connected to pins or screws 28 projecting from the sleeve 15. Thus after the plunger is depressed and the lever released the springs will raise the plunger and restore it to its original position.

Depending from the head 17 are spaced pairs of lugs 29 and between the lugs of each pair lies a lug 30 which projects outwardly from a carton periphery engaging member 31, these members being so arranged as to lie normally in downwardly and inwardly inclined positions and to completely surround a carton head. These members further have their lugs 30 connected to the respective lugs 29 by pins 32, the connection being thus a pivot or hinge connection. Normally these members are kept in inclined position by springs 33 seated in recesses 34 in the head 17 and in recesses 35 in the members 31.

It will be noted that no restriction exists as to size or shape of the plunger head and two different shapes of the many which may be used are here shown, a head for circular cartons being shown in Figs. 1, 2 and 4 and a head for square cartons being shown in Figs. 5 and 6. It will be obvious that other forms such as hexagonal, diamond shaped, oval and the like can readily be made. It will be noted however that whereas recesses 36 are formed in circular heads for convenient assembly of the pins 32, heads such as shown in Fig. 5 will require the corner lugs 29 to be shorter than the intermediate lugs.

On the under side of the table is a sleeve 37 in axial alinement with the plunger, the opening in the sleeve being continued through the table so as to accommodate a stem 38 which is held in adjusted position in the sleeve by a set screw 39. On the upper end of the sleeve is a carton carrier or holder 40 whereon may rest a carton A having a bumped head B and crimped over rim C′. Surrounding the carton holder is a split hollow cylinder or prism consisting of two halves 41 connected by hinges 42 and being of such height that depression of the plunger will bring the members 31 into contact with the top of the cylinder and thus force the inner portions of these members upwardly with reference to the plunger whereby they engage with and contract the rim C′ of the carton.

In order to support the inside of the bumped head B a die 43 is provided which fits the inside of said head closely and is carried on a stem 44 slidable in the opening 18 of the plunger. The upper end of this stem carries a collar 45 which is held in position by a pin 46, the purpose of this construction being to permit change of dies to which end the cap 20 may be removed and the stem 44 raised until the pin 46 can be withdrawn whereupon the collar will be released and the die dropped down till the stem 44 is free from the head 17. The reason for mounting the die slidably with relation to the head will be apparent when it it considered that a rigid mounting of the die would either limit the movement of the plunger or result in destruction of the carton head B.

In order to cause proper coöperation between the die and the members 31 the latter are provided each with a groove 47 and the die is provided with a flange 48 engaged in the grooves so that movement of the members 31 is accomplished by corresponding movement of the die whereby the latter constitutes in effect an anvil supporting the work (the rim C′) to be acted on by the members 31.

In operation paste is applied to one end of a carton body as by the device shown in my copending application filed September 25, 1920, and bearing the Serial Number 412,833. The head is then positioned on the body and the prepared carton placed in the holder 40, the split cylinder having been opened for that purpose. The split cylinder is then closed and the lever depressed. This causes the parts to assume the positions shown in Fig. 2 and the rim C′ is thus crimped firmly against the carton body. The lever is then released and the finished carton removed.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

Having thus described the invention, what is claimed as new, is:—

1. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, and means to engage and move said members inward as the plunger moves in one direction.

2. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, and means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members.

3. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly

extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, and means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members.

4. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, means to engage and move said members inward as the plunger moves in one direction, and means normally holding said members outwardly.

5. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, and springs yieldably holding the inner portions of said members away from the head.

6. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contact the space within said members, and springs yieldably holding the inner portions of said members away from the head.

7. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, means to engage and move said members inward as the plunger moves in one direction, and a form retaining die carried by the head centrally of said members and reciprocable with respect to said head.

8. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, and a form retaining die carried by the head centrally of said members and reciprocable with respect to said head.

9. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, and a form retaining die carried by the head centrally of said members and reciprocable with respect to said head.

10. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, means to engage and move said members inward as the plunger moves in one direction, means normally holding said members outwardly, and a form retaining die carried by the head centrally of said members and reciprocable with respect to said head.

11. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, springs yieldably holding the inner portions of said members away from the head, and a form retaining die carried by the head centrally of said members and reciprocable with respect to said head.

12. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, springs yieldably holding the inner portions of said members away from the head, and a form retaining die

carried by the head centrally of said members and reciprocable with respect to said head.

13. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, means to engage and move said members inward as the plunger moves in one direction, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and cooperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

14. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and coöperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

15. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and coöperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

16. In a machine of the class described, a reciprocable plunger head, carton periphery engaging members carried by the plunger head, means to engage and move said members inward as the plunger moves in one direction, means normally holding said members outwardly, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and coöperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

17. In a machine of the class described, a reciprocable plunger having a head, carton periphery engaging members having hinged connection with the head and normally inclined inwardly and downwardly, means engageable by the inner portions of said members during reciprocation of the head in one direction whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, springs yieldably holding the inner portions of said members away from the head, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and coöperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

18. In a machine of the class described, a reciprocable plunger having a head and provided with depending lugs arranged in pairs about its peripheral portion, carton periphery engaging members having outwardly extending lugs engaging between the respective pairs of the lugs on the head, pivot pins passing through said lugs, said members being normally inclined downwardly and inwardly of the head, means engageable by the inner portions of said members arranged in the path of said members whereby to force said inner portions upwardly with respect to the head and thus contract the space within said members, springs yieldably holding the inner portions of said members away from the head, a form retaining die carried by the head centrally of said members and reciprocable with respect to said head, and coöperating means on the die and said members arranged to move the die upwardly as the members are moved upwardly.

In testimony whereof I affix my signature.

FREDERICK COATES.