April 17, 1945. A. N. WEEKS 2,374,147

BALING BAG CLOSING APPARATUS

Original Filed Sept. 2, 1941 2 Sheets-Sheet 1

FIG. 1.

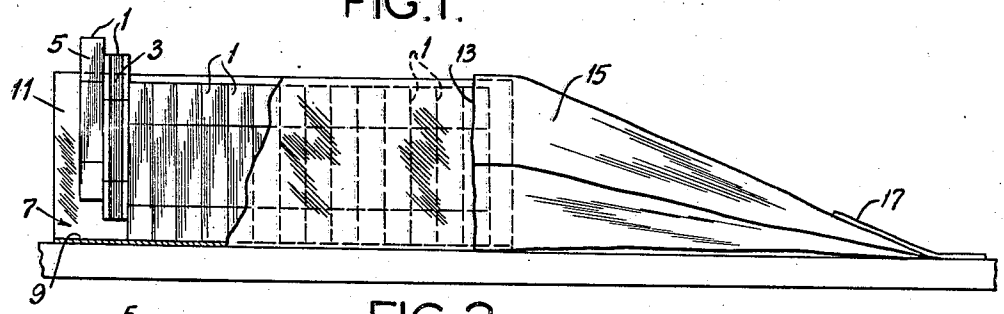


FIG. 2.

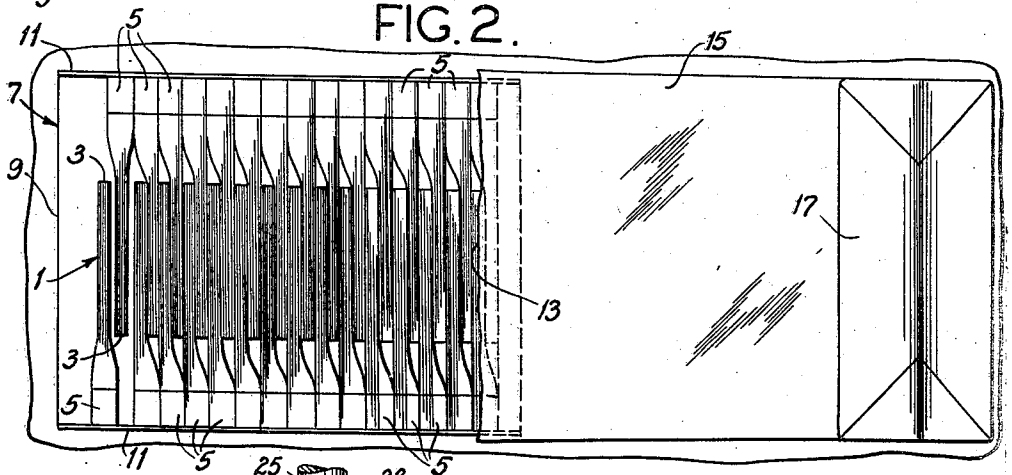


FIG. 3.

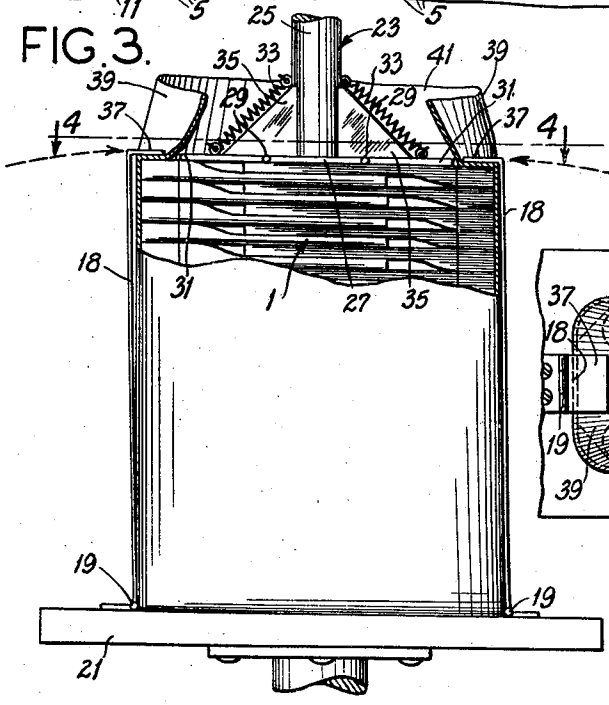
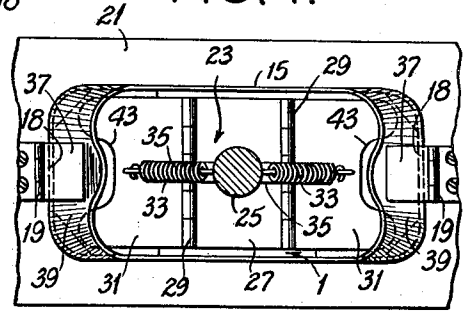


FIG. 4.



Arwed N. Weeks,
Inventor.
Haynes and Koenig,
Attorneys.

April 17, 1945. A. N. WEEKS 2,374,147

BALING BAG CLOSING APPARATUS

Original Filed Sept. 2, 1941 2 Sheets-Sheet 2

FIG. 6.

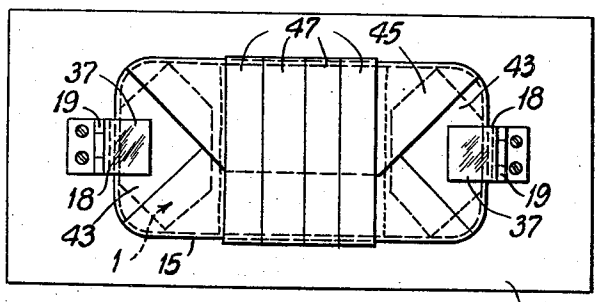


FIG. 5.

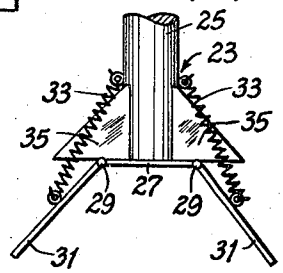


FIG. 7.

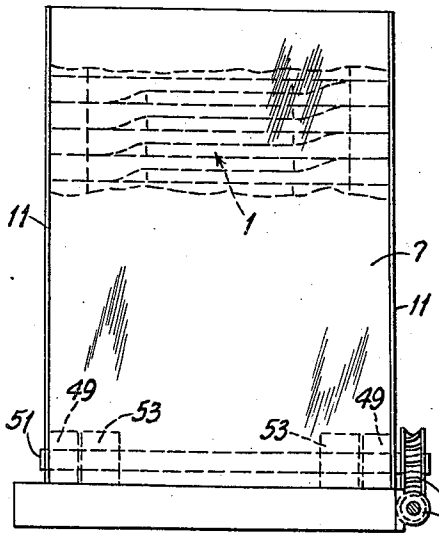


FIG. 9.

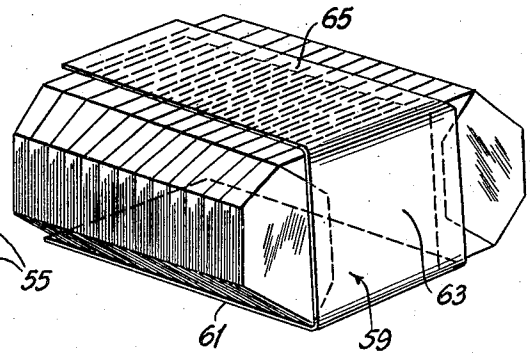
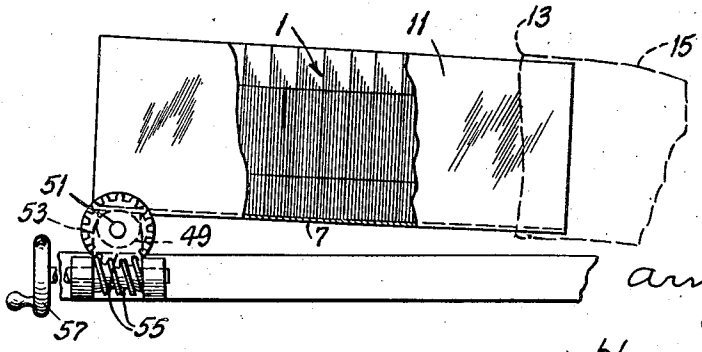


FIG. 8.



Arnold N. Weeks,
Inventor.
Haynes and Thorne
Attorneys.

Patented Apr. 17, 1945 2,374,147

UNITED STATES PATENT OFFICE

2,374,147

BALING BAG CLOSING APPARATUS

Arnold N. Weeks, North Scituate, Mass., assignor to Bemis Bro. Bag Company, St. Louis, Mo., a corporation of Missouri

Original application September 2, 1941, Serial No. 409,169. Divided and this application January 14, 1943, Serial No. 472,336

2 Claims. (Cl. 226—2)

This invention relates to baling, and with regard to certain more specific features, to an apparatus for closing baling bags and the like.

This application is a division of my copending United States patent application, Serial No. 409,169, filed September 2, 1941, for Bales, eventuated into Patent 2,342,565, dated February 22, 1944.

Among the several objects of the invention may be noted the provision of a compact, firm, well-compressed and shaped container for bags and the like, which is neater and more easily handled than the package heretofore used and in which chafing and deformation of the contents is avoided; and the provision of an apparatus for accomplishing a baling method which is fast and economical of time and material. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which are illustrated several of various possible embodiments of the invention,

Fig. 1 is a side view showing a baling tray associated with a receiving cover;

Fig. 2 is a plan view of Fig. 1;

Fig. 3 is a vertical section showing a filled container applied to baling apparatus;

Fig. 4 is a horizontal section taken approximately on line 4—4 of Fig. 3, showing a presser foot;

Fig. 5 is a fragmentary detail in side elevation of said presser foot;

Fig. 6 is a plan view of Fig. 3, with the presser foot removed and a closure operation completed;

Fig. 7 is a front elevation of an alternative form of a tray;

Fig. 8 is a side elevation of the tray of Fig. 7 indicated in a turned-down position; and,

Fig. 9 is a perspective view showing another modification.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Heretofore the packaging of paper bags for transportation was accomplished by wrapping paper around compressed groups of the bags and then tying these with baling rope.

According to the present invention, apparatus is provided whereby the bags are pressed together in and preparatory to closing an outside covering bag.

Referring now more particularly to Figs. 1 and 2, numeral 1 formally indicate groups of the bags which are to be packaged. In each group is a number of flat bags, say for example twenty-five. The bag mouths are at 3 and the bottoms are at 5. Since the bottom end of such a group is thicker than the mouth end, due to the construction of the bags composing the group, the groups are arranged alternatively with their mouths directed inward, as shown in Fig. 2. This is in order to obtain a column or pile of the bags which is of equal length on both sides. In order properly to form the column, the bags are stacked on edge horizontally in a U-shaped tray 7. This tray has a bottom 9 and side walls 11 for guide purposes.

The tray is partially inserted into the open mouth 13 of a larger baling bag 15 (Figs. 1 and 2) which is to form the bale cover. This bag 15 is closed at its bottom as shown at 17. After all of the bags which will be accommodated by the baling cover or bag 15 have been inserted into the tray, they are pushed endwise into 15, which opens automatically under the air pressure engendered ahead of the bags as they enter.

It has been found to be unsatisfactory simply to insert the bags 1 into the holding bag 15 and then to close the latter, because of the tendency of the interior bags 1 to become uneven laterally and to separate into a loose condition endwise. And, it is desirable to have a compressed condition of the interior bags so that the exterior covering baling bag 15 acts as a bale or tensioning cover.

In order to accomplish the desired ends, the loaded bag 15 is placed upright (Fig. 3) next to a pair of clamps 18, which are hinged at 19 on a platform 21. Prior to swinging the clamps 18 to the position shown in Fig. 3, a presser foot 23 is brought down into position within the bag 15. This presser foot is detailed in Fig. 5 and consists of a stem 25 on which is a lower pad 27. Hinged to the pad 27 at 29 are flukes 31 which are normally biased up into the flatwise position shown in Fig. 3. This is done by means of springs 33. The flukes are limited in their upward movement by triangular stops 35. The possibilities of downward movement are indicated in Fig. 5, this movement being against the bias of springs 33.

As the presser foot is brought down into the completely open mouth 41 of bag 15, the flukes are horizontal, as shown in Fig. 3. This is accomplished by relative movement between the

table 21 and the stem 25. It is not of importance which moves, the table 21 or the stem 25. The important thing is the relative movement which brings about compression of the bags within the baling cover 15. The degree of compression is such that the uppermost group of bags is brought just under the final positions of fingers 37 on said clamps 18, which are now swung into position so that portions 39 of the open mouth 41 of the bag are partially folded in over the ends of the contained bags. For this purpose the flukes are provided with clearing notches 43 (Fig. 4).

Next, the platform 21 and the stem 25 are separated, which causes a withdrawal of the presser foot from out of the mouth 41 of bag 15. Any interference with the ends of the flukes 31 by the partially closed portions 39 of the mouth is provided for by the flukes rotating downwardly and stretching the springs 33 as indicated in Fig. 5. This is in response to dragging contact by the flukes with the partially closed portions 39 of the bag mouth. In other words, the presser foot is collapsible in response to contact with the partially closed bag mouth as the presser foot is withdrawn.

Next, the operator folds shut the open mouth as indicated in Fig. 6. At this time the fingers 37 have determined endwise flat regions 43, over which are folded sidewise flat flaps 45, one of the flaps 45 being over the other. Then holding strips 47 are adhered over the end of the bale, and thereafter the clamps 18 are swung outward to free the fingers 37 from holding position above the bale. Thereafter, the compressed bags which form the contents of the bale 15 spring apart, because of their relative elasticity upon release. Thus the contents of the bale are under tension and the result is a neat, tight package which would not be obtained simply by inserting bags into a baling bag and closing it.

In Figs. 7 and 8 the tray 7 is shown provided with ears 49 and a rotary shaft 51, the latter passing through bearing blocks 53. The shaft 51 is under control of a gearing 55, operable from a hand wheel 57, so that the tray 7 may be moved from a vertical position to a more or less horizontal position.

In Fig. 7 the tray 7 is shown vertical, and in dotted lines is shown how the bags are applied in the tray. In Fig. 8, the loaded tray is shown as having been turned down and the mouth 13 of a baling bag 15 brought into position over the end of the tray, preparatory to pushing the contents of the tray into the baling bag. From this point on, the operations are the same as those described in connection with Figs. 3–5.

If desired, instead of using a rigid tray for aligning the bags preparatory to placing them in the baling bag 15, a strip of paper 59 may be laid down and after placing a group of the bags upon one reach 61 of said paper, it is brought around the end of the column of bags as indicated at 63, and then over them as indicated at 65. This forms a cradle. Then the assembly of Fig. 9 is manipulated so that the end 63 is inserted into the mouth 13 of the baling bag 15, the paper 59 being left in the package. Thereafter, the bale is manipulated along the lines described in connection with Figs. 3–5.

One of the principal features and advantages of this invention is the use of a widely diffused or dispersed retention of the compressive force, originally imposed, by the bale-forming bag which performs the double function of a tension medium and a protective cover, to produce generalized restraint with the elimination of concentrated points of force as produced by ropes, steel bands, wires, or other localized restraining mediums which cause cutting, chafing, distortion, wrinkling and other defects and damages.

Another advantage arises from the holding of inner bags under generalized compression in the compact edgewise arrangement shown. This produces a solid and compact unit which naturally stacks and handles so that bags remain in edgewise position at all times. Such position completely eliminates resilience and spring which is characteristic of ordinary bales and bundles of bags and eliminates damage from rubbing and chafing in shipping which is unavoidable in irregularly shaped resilient bundles of bags produced by other methods.

Another advantage of this invention consists of its economy of materials since only a minimum of overlap is used at all points and by utilizing the tensile strength of the covering bag the use of ropes, wires, straps, etc., is entirely eliminated.

Another advantage of the invention is the fact that the accordion-like expansion of the contents within the bale-forming bag 15 serves to tension the entire surface of the bale and to provide a neat appearance. In addition, loading is relatively easy, considering the results obtained. For example, no ordinary wrappings are needed or baling bands. The advantages of a bale are obtained by using an ordinary bag.

The invention saves wrapping material, because the preformed bag 15 requires only small overlapping portions at its seams; whereas the former wrapping sheets needed to be overlapped several inches to form an effective package.

In addition, the present invention allows of stacking a greater number of bags in one stack without the danger of sidewise slippage. In this connection, it may be noted that the clamps 18 are positioned right next to the opposite ends of the stack, and serve alignment purposes during the compressive operation of the presser foot. Thus the side clamps hold the sides of the container bag 15 and also hold the contained bags compressed.

It is of substantial importance that the presser foot perform its pressing operation near the ends of the contained bags, and not only at the center, so that the ends do not spring up. This means that the tucked-in portions 39 of the bag mouth will necessarily interfere with withdrawal of the presser foot, unless it is collapsibly constructed, as above described. Thus it will be seen that a presser foot of substantial expansion and collapsibility upon withdrawing movement is important.

It is to be understood that the final article consists of a stack of bags which have their mouths alternately oppositely directed and lying adjacent to (as distinguished from overlapping) the bulged bottom portions of alternate bags, all compressibly assembled in a bale which is stretched and tensioned by the normal tendency of the bags to expand therein. The contained bags described are class examples of flat articles in general that may be baled by the means herein described.

Attention is called to applicant's copending application Serial No. 472,335, filed January 14, 1943, for Baling method.

In view of the above, it will be seen that the several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. Closing apparatus for a filled and open-mouthed baling bag having therein a column of laterally disposed substantially flat articles, comprising a supporting platform for the filled bag, a relatively movable presser assembly movable into and out of the bag mouth, a central portion constituting a part of said assembly, stops associated therewith, laterally directed hinged flukes forming a part of said assembly and having pressure faces engageable with said column, means biasing said flukes against said stops in which position said pressure faces are coplanar, said flukes being movable angularly toward one another against said biasing means, said flukes being shaped to expose end portions of the column of articles when applied thereto in said baling bag, laterally movable clamps having holding faces movable from the outside of the baling bag into substantial coplanar positions with the pressure faces of the flukes and over the said exposed portions, whereby portions of the baling bag are tucked in and the column held, said flukes being movable against said bias by any engagement thereby with tucked-in portions of the baling bag upon axial withdrawal of the presser assembly from the baling bag, the clamps and flukes being in non-interfering positions with respect to one another under relative axial movement of the flukes under withdrawal.

2. Closing apparatus for a filled and open-mouthed baling bag having therein a column of laterally disposed substantially flat articles comprising a supporting platform for the filled bag, a relatively movable presser assembly movable into and out of the bag mouth, laterally directed hinged flukes forming a part of said assembly and having pressure faces engageable with said column inside the bag, stops forming part of the assembly, means biasing said flukes against said stops in which position said pressure faces are coplanar, said flukes being movable angularly toward one another, said flukes being shaped to expose end portions of a column of articles when applied thereto in said baling bag, laterally movable clamps having holding faces movable from the outside of the baling bag into substantially coplanar positions with respect to the pressure faces of the flukes and bending parts of the bag over said exposed portions to hold the column in compression as brought about by the presser assembly, said flukes being movable against said bias by engagement thereby with the bent-in parts of the bag upon axial withdrawal of the presser assembly, the clamps and flukes being in non-interfering positions with respect to one another under relative axial movement of the flukes when withdrawn from the bag.

ARNOLD N. WEEKS.