Nov. 26, 1968 R. E. SCHORER 3,412,522

MECHANISM FOR SUCCESSIVELY FEEDING BAGS TO A BAG LOADING MACHINE

Filed July 6, 1965 4 Sheets-Sheet 1

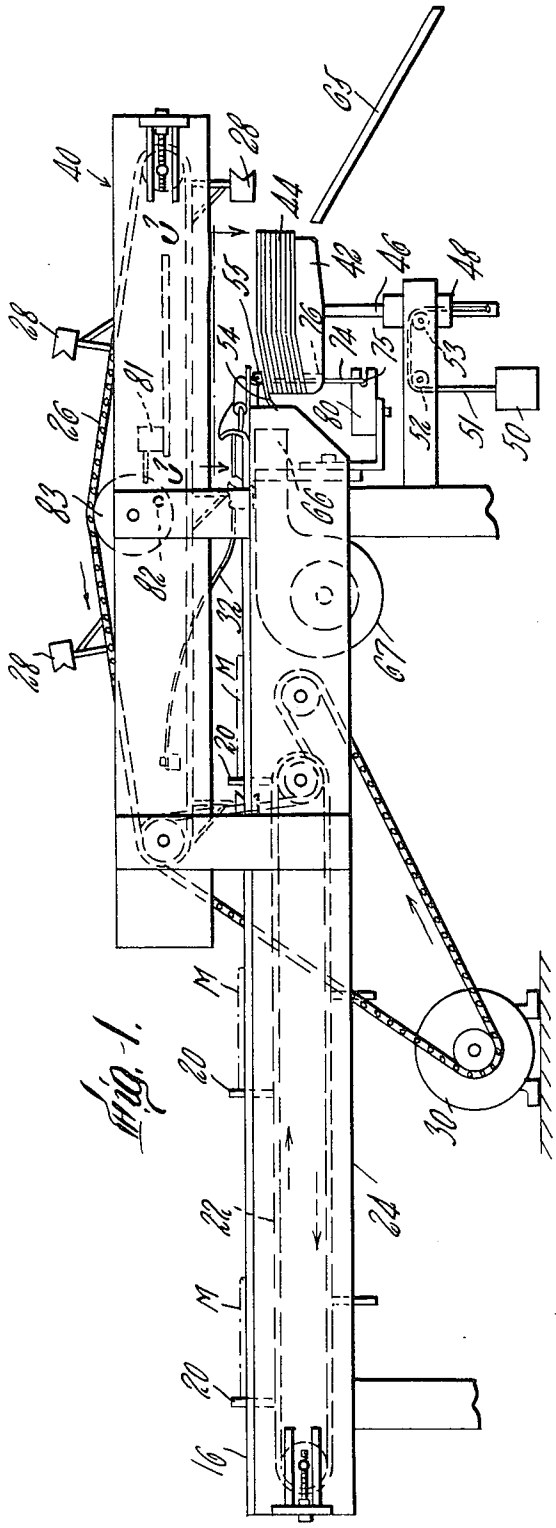


Fig. 1.

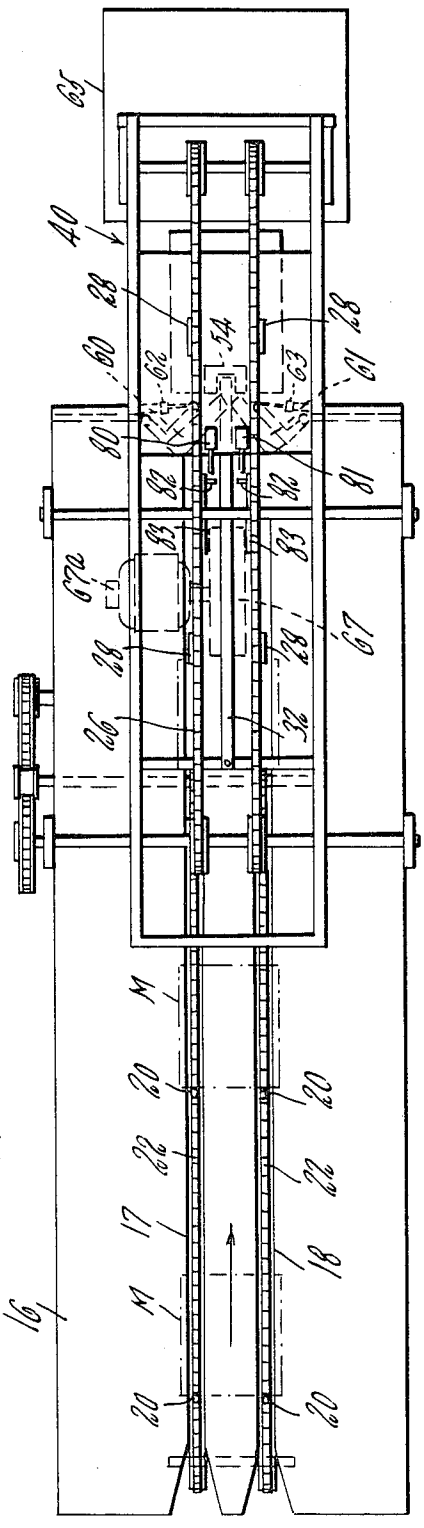


Fig. 2.

Nov. 26, 1968 R. E. SCHORER 3,412,522

MECHANISM FOR SUCCESSIVELY FEEDING BAGS TO A BAG LOADING MACHINE

Filed July 6, 1965 4 Sheets-Sheet 2

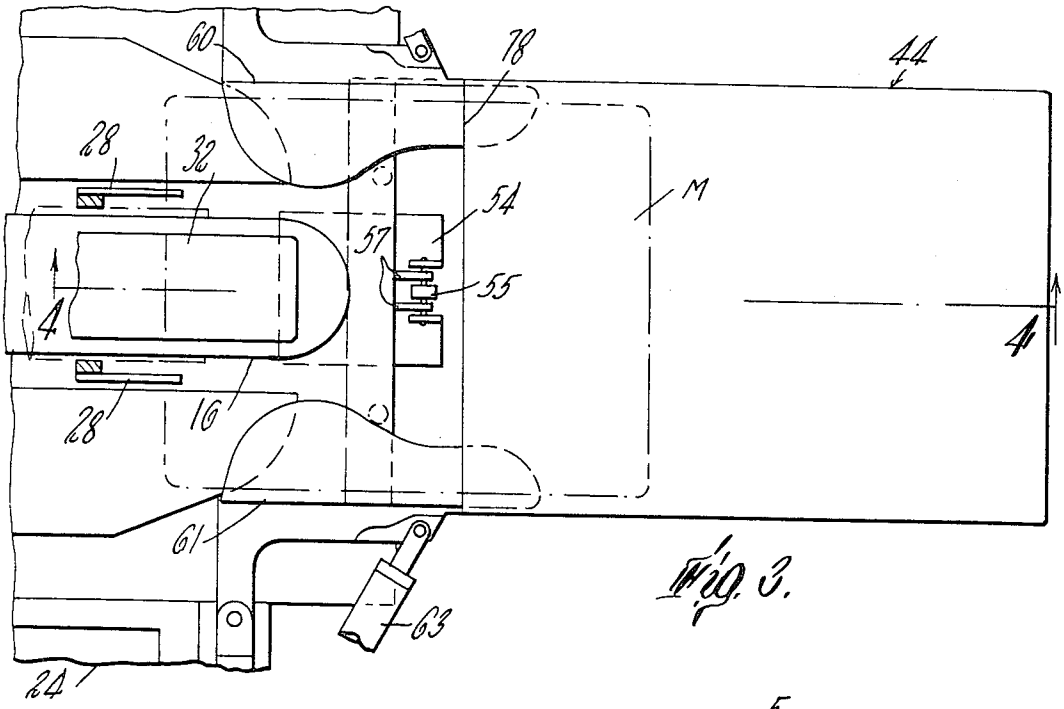


Fig. 3.

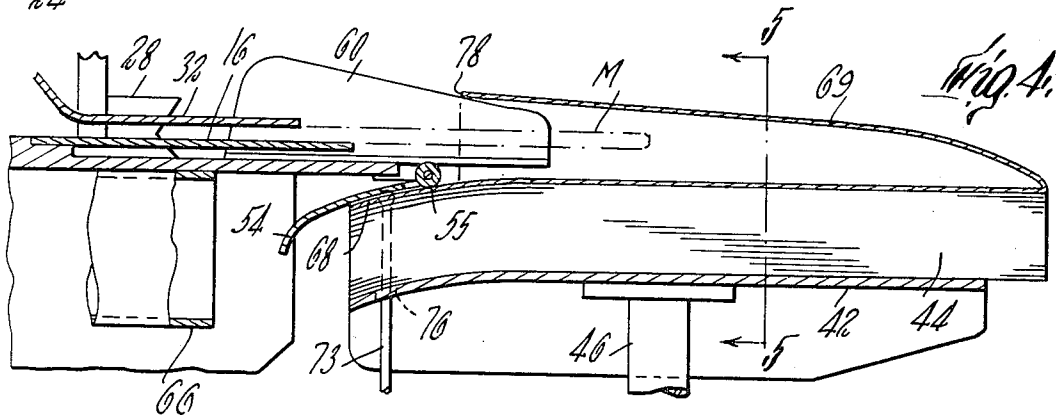


Fig. 4.

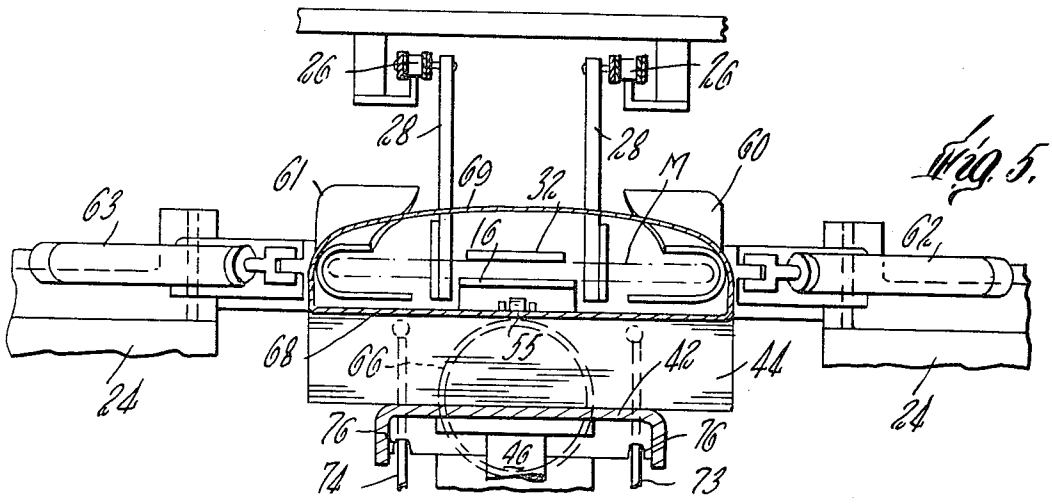
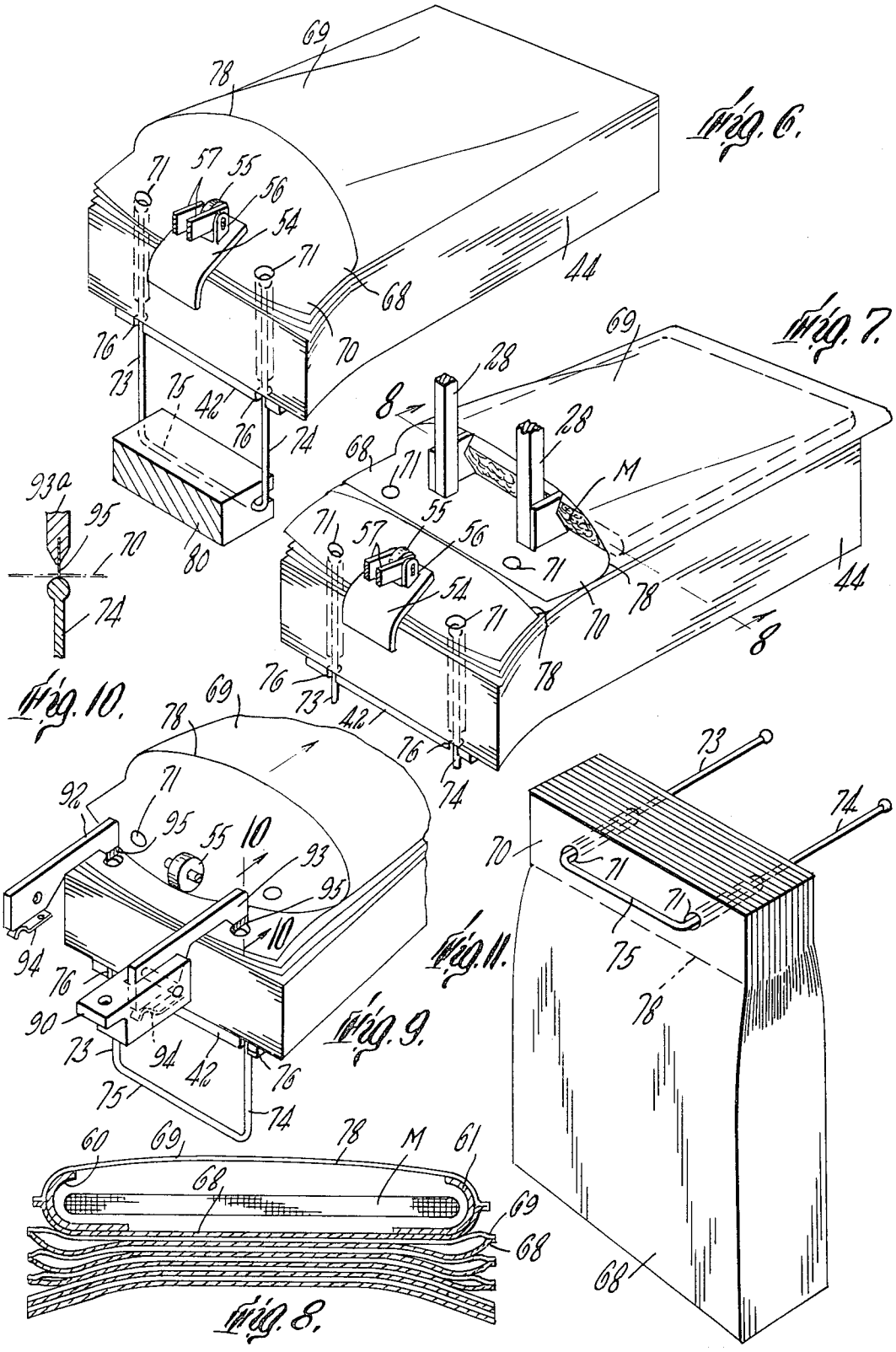


Fig. 5.

Nov. 26, 1968 R. E. SCHORER 3,412,522

MECHANISM FOR SUCCESSIVELY FEEDING BAGS TO A BAG LOADING MACHINE

Filed July 6, 1965 4 Sheets-Sheet 3



Nov. 26, 1968 R. E. SCHORER 3,412,522

MECHANISM FOR SUCCESSIVELY FEEDING BAGS TO A BAG LOADING MACHINE

Filed July 6, 1965 4 Sheets-Sheet 4

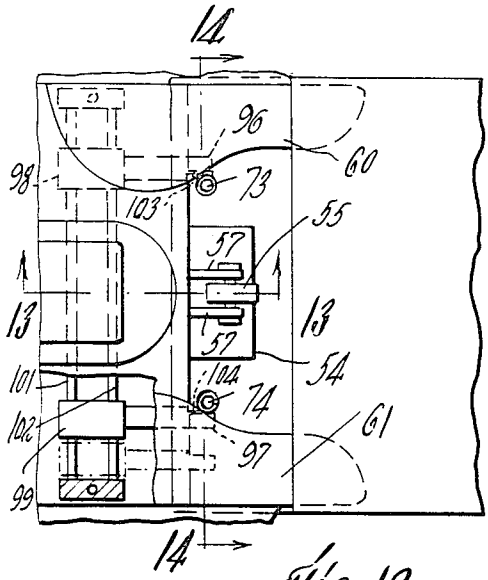


Fig. 12.

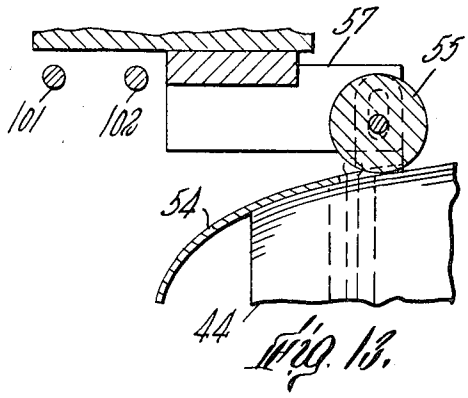


Fig. 13.

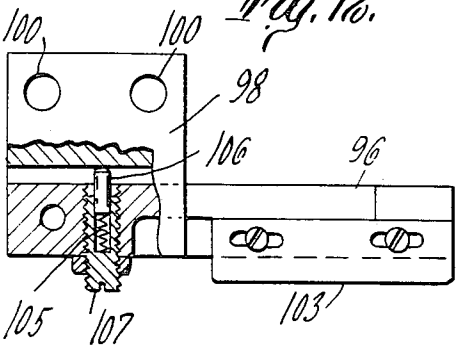


Fig. 15.

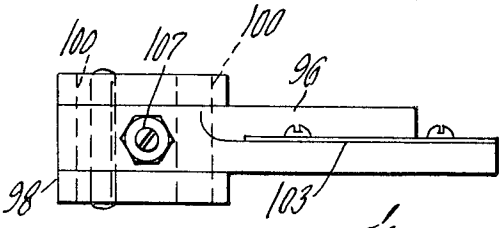


Fig. 16.

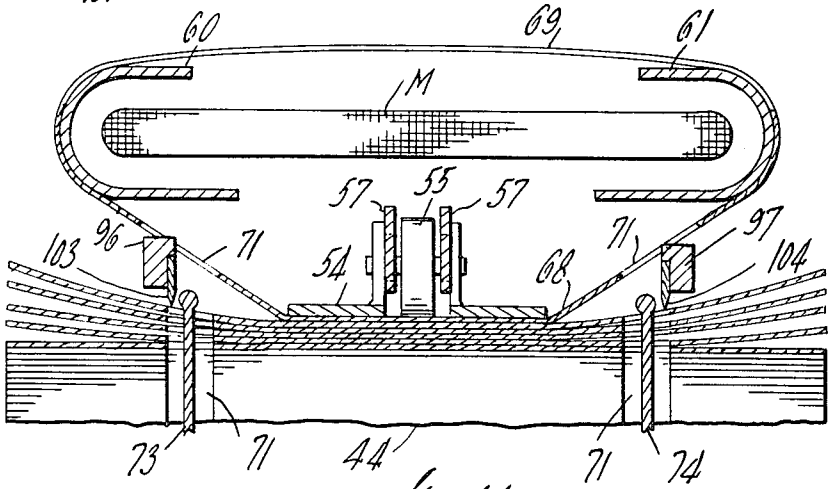


Fig. 14.

United States Patent Office 3,412,522
Patented Nov. 26, 1968

3,412,522

MECHANISM FOR SUCCESSIVELY FEEDING BAGS TO A BAG LOADING MACHINE

Roy E. Schorer, Westwood, Mass., assignor to The William Carter Company, Needham Heights, Mass., a corporation of Massachusetts

Filed July 6, 1965, Ser. No. 469,501
4 Claims. (Cl. 53—189)

ABSTRACT OF THE DISCLOSURE

A bag loading machine which has a stack of collapsed bags on a vertically movable platform. The topmost bag is lifted into open-mouthed configuration to receive an article moved into the open bag. The loaded bag is then moved horizontally off the stack of bags. In order to maintain the rest of the bags in alignment on the platform, they are impaled on a U-shaped wicket whose parallel legs pierce flaps of the bags. The wicket is inserted through the flaps so that the connecting leg of the wicket lies on the bottom instead of, as has been common in the art, on top of the stack. As a result, the topmost bag flap is either lifted off the top, free ends of the wickets as the bag is lifted into open-mouthed configuration or cutters can be provided to cut the flap either during movement of the topmost flap upwardly or during its movement away from the fixed wicket, rather than tearing the cutter from a wicket which has its connecting leg on top of the stack.

This invention relates to bag loading machines, and more particularly, to a new and improved bag assembly and cooperating machine elements permitting the ready insertion of a supply of bags into the machine for feed of the top bag in a vertical stack of bags upwardly into open-mouthed position facing articles being fed in successive spaced relation horizontally through the loading machine.

A machine of this type is described in my co-pending application, Ser. No. 347,924 filed Feb. 27, 1964, now Patent No. 3,330,093 using a wicket-bag assembly wherein, as in Saumsiegle, Patent No. 3,165,870 and in Davis et al., Patent No. 3,184,055, the wicket legs run down through the bag stack with the crosspiece of the wicket extending over the upper exposed face of the flap on the major longer wall of the topmost bag in the stack.

With such assemblies, it is necessary to tear the top bag off the posts of the wicket to remove the top bag having an exposed mouth from the stack, for which purpose the bags are sometimes provided with lines of perforations running from the wicket leg receiving apertures out to the flap edge for more easy and guided tearing.

In accordance with one form of the present invention, such tearing is avoided by inserting the U-shaped wicket the other way up into the bag stack and then providing on the loading machine means located below, instead of above the stack, for holding the wicket crosspiece so that the free ends of the legs of the U extend upwardly to a fixed common level near, but beneath, the path of advancing articles to be loaded.

In this way, the topmost bag escapes from the wicket by passing over the tops of the legs, without requiring any tearing of the material forming the flap. Such tearing sometimes becomes exceedingly troublesome in the case of bags made of the heavier gauges of film.

One object of the invention thus is to provide a bag-wicket assembly which is as simple and as readily transportable as such previous assemblies, but wherein the bags do not need to be torn from the wicket posts during the loading machine operation, but rather pass upwardly off the free ends of the wicket.

To this end, the wicket is inserted through the bag stack from the opposite side of the stack, i.e., the crosspiece will be on the back or bottom face of the stack which does not expose a bag mouth, rather than on the front or top face of the stack, which does expose a bag mouth.

Such a wicket bag assembly is then inserted into the machine so that the U stands substantially upright instead of being inverted, and the U is held in this position on the machine by a clamp which engages the wicket crosspiece below the bottom of the vertical bag stack and holds the upper ends at a common level.

In a modified form of the invention, the upper ends of the posts engage two overhanging hold-downs which hold the top bag from inadvertently escaping off the post ends, but permit the flap to be frictionally pulled out between the superposed hold-down members and post ends during the loading operation. The post ends may be ball shaped to reduce the area of contact or may have small rollers to reduce the friction as the bags are withdrawn. Or, the hold-downs may be knife edges which cut the bag material either on top of the post ends, or on either side thereof from points adjacent or in the bag apertures to the front edge of the bag flap.

These and other objects of the invention will be more fully understood when taken in connection with the following description of a typical embodiment of the invention as shown in the drawings wherein:

FIG. 1 is an elevational view of a bag loading machine incorporating the invention;

FIG. 2 is a plan view thereof;

FIG. 3 is an enlarged plan view of the loading station contained in the machine;

FIG. 4 is a cross-sectional view taken along the line 4—4 of FIG. 3;

FIG. 5 is a cross-sectional view taken along the line 5—5 of FIG. 4;

FIG. 6 is an isometric view of certain parts of the machine at the loading station at a given point in the machine cycle;

FIG. 7 is an isometric view, similar to that of FIG. 6, showing certain parts of the machine at the loading station at a later stage of the machine cycle;

FIG. 8 is a cross-sectional view showing certain of the parts at the loading station at a still later stage of the cycle;

FIG. 9 is a fragmentary view showing a modification at the loading station;

FIG. 10 is a fragmentary cross-sectional view transversely of the machine, illustrating a further modification;

FIG. 11 is a perspective view of a bag assembly, including a wicket, constituting a feature of this invention;

FIG. 12 is a fragmentary view showing another modification at the loading station;

FIG. 13 is a cross-sectional view taken along the line 13—13 of FIG. 12;

FIG. 14 is a cross-sectional view taken along the line 14—14 of FIG. 12;

FIG. 15 is an enlarged detailed view of certain of the parts shown in FIG. 12; and

FIG. 16 is a bottom view of the parts shown in FIG. 15.

The machine shown in FIGS. 1 and 2 is, except for modification at the loading station, identical with that described in my co-pending application, Ser. No. 347,924 filed Feb. 27, 1964, now Patent No. 3,330,093.

As shown in FIG. 1, articles of merchandise M are fed into the machine successively, being pushed along a stationary bed **16** which has a pair of spaced parallel slots **17** and **18** to accommodate pusher fingers **20** carried by an endless conveyor **22**. The machine is particularly useful for packaging knit garments which are folded about

a cardboard insert to give a degree of rigidity desirable for best appearance of these garments when packaged.

The machine frame **24** also carries an overhead endless conveyor **26** having pairs of pusher fingers **28** spaced therealong, the spacing of the fingers **28** being so related to the spacing of the fingers **20** on the conveyor **22** that the successive pairs of pusher fingers **28** pass downwardly into the slots **17** and **18** behind the fingers **20** as the latter reach the inner end of their upper traverse, so that, as the fingers **20** move downwardly around their inner pulleys to their return traverse, the pusher fingers **28** on the overhead conveyor pick up each article M and push it towards a loading station. For this purpose the two conveyors are driven in synchronism from a common motor **30** through appropriate chains and sprockets.

As an article M proceeds toward the loading station, it passes beneath a compressor bar **32** which extends downwardly between the paths of the fingers **28** and presses down the center of each package so that successive packages will not exceed a maximum height.

The loading station is indicated generally at **40**. It includes an elevating platform **42** adapted to carry a vertical stack of empty, collapsed polyethylene or similar bags **44**. The platform is mounted on a pedestal **46** which extends downwardly through a bearing **48** and is urged continuously upwardly as by a weight **50** connected by a cord **51** running over pulleys **52** and **53** to the pedestal **46**.

The bags are clamped on the platform **42**, and its upward movement is limited by an anchoring means in the form of a shoe **54** (best shown in FIG. 6) which rests on top of the inner end of the vertical bag stack through the interposition of a small roller **55** journaled between trunnions **56** having vertical slots carrying a pin which loosely connects the shoe **54** to the frame of the machine through a pair of rigid arms **57**, as shown in FIGS. 3 and 6.

Pivoted on the frame just ahead of the loading station **40** are a pair of gate-like horns **60** and **61** which swing about vertical axes from a closed transverse position ahead of the loading station into opened parallel position extending into and holding open an open bag mouth, as shown in FIGS. 3 and 4, by the actuation of separate fluid motors **62** and **63**, respectively, in timed relation to the passage of the articles M, as will be hereinafter described.

Beyond the loading station a chute **65** (FIG. 1) is positioned to receive the loaded bags as they pass beyond the loading station in a manner to be described.

The opening of each bag at its mouth end facing the approaching article M to permit insertion of the horns is accomplished initially by a continuous blast of air directed through nozzle **66** of an air blower **67** positioned beneath the bed **16** and driven by motor **67***a*.

In the embodiment shown in the drawings, the machine is intended to operate with the use of polyethylene bags of the type which are folded and heat sealed on three sides leaving an open mouth on the fourth side, but one of the opposing walls **68** (FIG. 6) is longer than the other wall **69** forming a flap **70** provided with a pair of apertures **71** so that a stack of the bags may be readily handled by impaling them on two guide rods or posts **73** and **74**. Normally, in the past, where the two rods have been connected by a crosspiece **75**, wherefrom the name wicket is derived, the wicket has been inserted from the top of the stack with the crosspiece overlying the exposed inside surface of the flap on the longer wall of the uppermost bag in the vertical stack. In accordance with this invention, and as shown in FIG. 11, the crosspiece **75** is now on the bottom of the vertical stack and is inserted upwardly through the pairs of holes **71** in the stack of bags, all of which have their shorter walls on top of their longer walls.

The shoe **54**, previously described, is so dimensioned and so positioned, that when a stack of the wicketed bags is placed on the elevating platform **42**, the top ends of the wicket legs **73** and **74** pass upwardly through the bag apertures **71** and the crosspiece **75** is then inserted into a slotted clamp **80** attached to the machine to hold the wicket upright with its legs clearing table **42** through slots **76** (FIG. 5) in the forward end of table **42** and with its top ends at a common level as shown in FIG. 4. The wicket, therefore, still functions, as in the case of inverted wickets, as a means for keeping the bags in alignment on table **42**.

It will also be noted that the supporting surface of the elevating platform **42** preferably slopes upwardly beneath the shoe **54**, as shown in FIG. 4, and is narrower, as shown in FIG. 5, than the width of the bags. This configuration helps to keep the lip **70** below the level of the remainder of the top bag and compensates for any increased bulk at the side-sealed edges of the stacked bags and prevents "middle sag" in the stack by allowing the side edges to drape laterally over the platform **42**, as shown in FIGS. 6, 7 and 8.

Air propelled by the blower through the nozzle **66** thus impinges against the entire front wall of the stack not covered by shoe **54** which retains the lip **70** of the topmost bag, but not the inwardly offset mouth edge **78** of the upper wall **69** of the top bag, so that the air inflates the top bag so that its upper wall assumes more or less the configuration shown in FIG. 6, after which the horns **60** and **61** are pivoted into the opened mouth to gently stretch and hold it fully open mechanically and surrounding the path of the advancing articles M.

When the leading edge of an inserted article M engages the closed opposite end of the top bag held in the stack, after being pushed into the bag by the pusher fingers **28**, the continued motion of the pusher fingers will draw the bag out from beneath shoe **54** and roller **55** clearing the top ends of the wicket legs **73** and **74**, either as a result of the previous inflation or of the horn insertion. The topmost bag is thus carried off the stack. As soon as the loaded bag is free of the stack, it drops by gravity into the downwardly inclined chute **65** (FIG. 1), falling off the pusher fingers **28** as it accelerates due to the drop, thereby freeing the fingers **28** to continue their path of movement up and over the overhead conveyor in their return motion.

While the top bag is being loaded, as seen in FIG. 8, the turbulent air stream tends to separate the mouth edges of the next underlying and sometimes several of the underlying bags, particularly because they are free to flutter at their side portions. When the uppermost bag is straightened widthwise by the horns **60** and **61**, the air gets in between the upper and lower walls of the underlying bag and starts to open it, except as restrained by the bottom wall of the overlying bag.

However, as soon as the fingers **28** have cleared the horns **60** and **61**, the horns are retracted, and as soon as the top bag clears the inner mouth edge of the next underlying bag, the air almost instantly inflates the underlying bag to the position shown in FIG. 6 ready to receive the horns and the next oncoming article M.

The motion of the horns **60** and **61** is so timed with respect to the advance of the fingers **28** that they will swing into the top bag just prior to or as they are contacted by the advancing article of merchandise M and will be retracted as soon as they can clear the advancing fingers **28**. This actuation is accomplished by a pair of switches **80** and **81** (FIG. 2) actuated by pins **82** carried by the upper sprocket **83**, a mechanical operation which need not be further described.

FIG. 9 shows a modification wherein the machine is provided with two brackets **90**, each of which suspends a hold-down member in the form of a pivoting latch **92** and **93** which swings downwardly and is held by a spring **94** against the top ball end of the underlying wicket post **73** and **74**. With this construction, the bag is held down at three points instead of just by the shoe until it is withdrawn by the pushers.

FIG. 10 illustrates a latch hold-down member 93*a* which carries a razor blade edge 95 extending longitudinally of the machine which acts to cut the bag material as it is withdrawn over the top of the underlying post 74. A similar member 93*a* would be utilized over post 73.

In FIG. 12, hold down members 96 and 97 are pivoted in blocks 98 and 99 having apertures 100 for slidable engagement with a pair of parallel rods 101 and 102 fixed on the machine frame. The blocks may thus be adjusted transversely on the machine to align the knife edges 103 and 104 carried by the hold down members with the holes 71 in the top bag or either inside or outside of these holes.

Springs 105 seated below pins 106 in recesses in screw-threaded rods 107 provide limited upward pivoting motion of the hold down members.

With this modification, the blades usually act before the top bag starts its longitudinal movement, i.e., either when the air inflates the bag or when the horns stretch the bag laterally. Thus in FIG. 14, the horns 60 and 61 have exerted so much lifting force on the sides of the flap 70 that the flap material is slit by the blades from the apertures 71 to the edge of the flap thus permitting the slit flat to lift upwardly around the hold-down members and off of the free top ends of the posts 73 and 74. However, the middle portion of the flap is still retained by the roller 55, but the top bag is about to be released therefrom by the article M engaging the opposite closed end of the bag. As shown in FIG. 14, the cutting edges 103 and 104 tend to hold down the next underlying bag and permit more ready separation of the top bag because only the top bag flap is being submitted to the lifting force imparted by the air or horns which provide an upward cutting force causing the blades to slit the flap 70 of only the top bag.

The arrangement of FIG. 14 is also useful when the posts are connected at the top by a connecting crosspiece, as in the form of wicket assembly shown in by co-pending application above referred to, as the blades, if aligned to intersect the holes 71, tend to cut the flap as the bag is withdrawn from the posts thus exerting less restraining force against horizontal bag withdrawal than is exerted by some bag materials when they have to be torn, unslit, off the posts.

It is to be understood that the loaded bags may progress to a mouth sealing machine which can and usually does sever off the marginal portions of both walls beyond the original mouth edges, so that the torn or cut lip 70 is not restained in the final package.

What is claimed is:

1. In a bag loading machine having:
platform means for supporting a vertical stack of collapsed flat bags,
means for lifting the top wall of the topmost bag to bring the mouth of said topmost bag in said stack into an open-mouthed configuration on top of said stack, and
means for inserting an article into said open-mouthed bag and for withdrawing said inserted article and top bag horizontally off said stack;
that improvement for restraining the bags on said platform which comprises parallel guide rods having free, unconnected upper ends extending upwardly through flaps integral with the bottom wall of each bag in said stack to a common level, and a roller between said guide rods always frictionally engaging the central portion of the topmost exposed flap of the bags in the stack, both while the lifting means lifts the sides of the topmost bag above the upper ends of said rods and while the lifted bag is being withdrawn from beneath said roller, free and clear of said guide rods, by said withdrawing means, said roller maintaining a yet unlifted next topmost bag below the upper ends of and impaled on said rods to prevent said as yet unlifted bag from being withdrawn by said withdrawing means with the previously lifted bag.

2. In a bag holding machine having a platform for holding a vertical stack of collapsed flat bags having open mouths defined between a shorter wall and an opposed longer wall and having means for elevating said platform as loaded bags are removed from said stack, that improvement for restraining said bags misalignment on said platform which comprises parallel guide rods forming an integral part of a U-shaped wicket having a bottom connecting cross piece joining said parallel guide rods, said guide rods having the free upper ends extending upwardly through the extending portions of said longer bag walls, a stationary fixture on said machine below said stack for receiving and removably retaining said cross piece and for supporting said guide rods with their top ends at a fixed equal level adjacent the top of said stack as said platform is elevated with removal of successive bags from the top of said stack and a pair of hold down members having parallel knife edges extending longitudinally of said stack, said knife edges engaging the tops of said guide rods permitting the longer wall of the top bag on said stack to be withdrawn over the tops of said rods in cutting relation with said hold down member knife edges.

3. In a bag loading machine having:
platform means for supporting a vertical stack of collapsed flat bags, including
a pair of upright spaced guide rods piercing layers of flaps integral with one wall of each bag in said stack, and having
means for lifting the top wall of the topmost bag to bring the mouth of said topmost bag in said stack into an open mouth configuration on top of said stack, and having
means for inserting an article into said open-mouthed bag and for withdrawing said inserted article and top bag horizontally off said stack,
that improvement which comprises a pair of spaced parallel cutting edges overlying the flap layers of said bag stack for slitting the flap in the topmost bag as said lifting means brings a top bag in said stack into open mouth configuration from points adjacent said guide rods outwardly to the front flap edge thereof to aid in releasing individual successive top bags cyclically from said guide rods.

4. The improvement as claimed in claim 3, having guide rods which are unconnected at their upper ends and wherein said lifting means lifts the flap of the topmost bag off the tops of said guide rods after said cutting edges have slit said flap material.

References Cited

UNITED STATES PATENTS

733,395	7/1903	Hutchinson	53—189
3,206,913	9/1965	Fleigher et al.	53—189
3,217,464	11/1965	Feingold	53—385 X
3,233,639	2/1966	Davis et al.	53—385 X

TRAVIS S. McGEHEE, *Primary Examiner.*

R. L. SPRUILL, *Assistant Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,412,522 November 26, 1968

Roy E. Schorer

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 38, "by" should read -- my --; line 49, "restained" should read -- retained --. Column 6, line 14, after "bags" insert -- against --.

Signed and sealed this 17th day of March 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents