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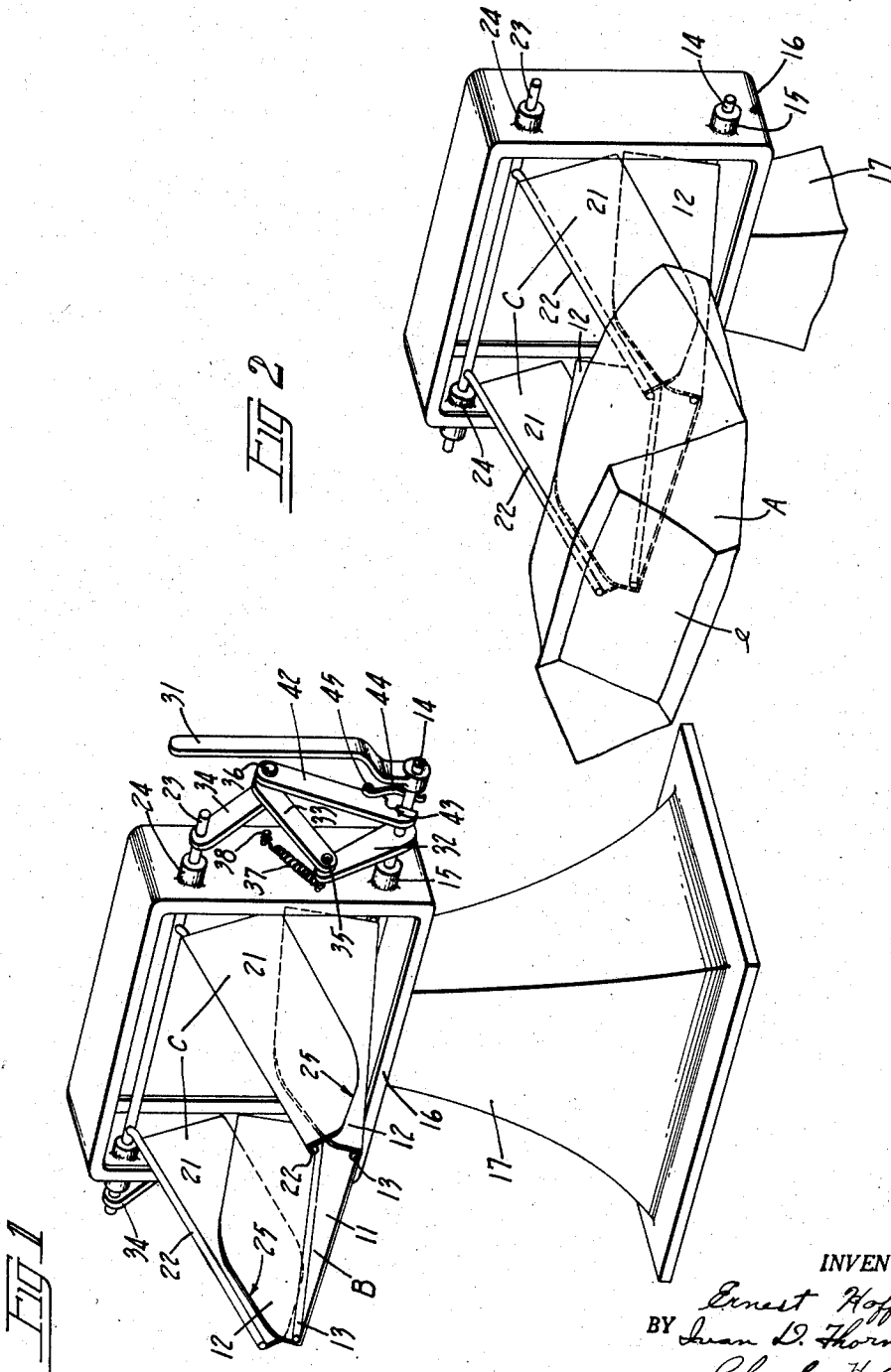
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BAG OPENING MACHINE WITH UPPER AND LOWER BAG FORMING UNITS

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2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

FIG 3

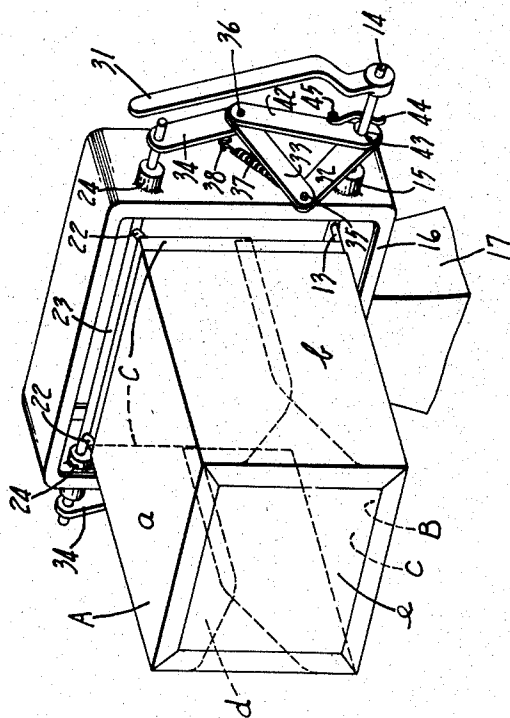
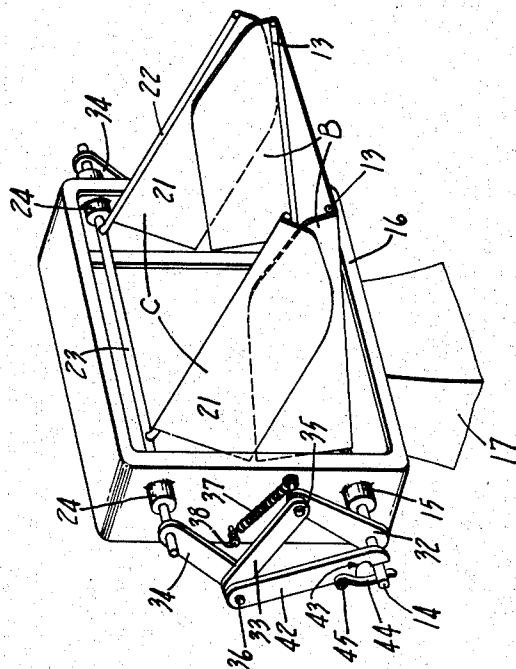


FIG 4



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BAG OPENING MACHINE WITH UPPER AND LOWER BAG FORMING UNITS

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This invention relates to bag or container opening machines and has particular reference to a machine for opening or expanding folded or collapsed bags, flexible containers and the like and for holding them in opened position for filling.

An object of the invention is the provision of a bag opening machine for opening folded or collapsed flexible bags, shipping carriers and the like into expanded article receiving condition.

Another object of the invention is the provision of a bag opening machine having elements which permit the telescoping of a collapsed or partially opened bag thereover in one position and which in another position expand the bag into contents receiving condition and thereafter release the filled bag or carrier.

Still another object of the invention is the provision of such a machine of simple construction wherein a combination of devices cooperate to expand a collapsed or partially opened bag and hold it in article receiving condition and guide the articles into filling position within the expanded bag.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of a bag opening machine embodying the present invention;

Fig. 2 is a view similar to Fig. 1, with certain parts removed and showing a partially opened bag being slipped or telescoped onto expandable and contractable bag opening or forming mandrel units;

Fig. 3 is a view similar to Fig. 2 showing the bag opening units in fully expanded position within a bag, causing the latter to be fully telescoped and expanded thereover; and

Fig. 4 is a perspective view of the machine showing operating parts located at and viewed from the side of the machine opposite to that of Fig. 1.

As a preferred embodiment of the invention, the drawings illustrate a machine for opening folded or flattened bags, flexible containers, shipping carriers and the like designated by the letter A, which, upon being partially opened and slipped over wedge shaped contractable and expandable mandrel units of the machine, may be fully expanded into filling condition.

The bag A is usually made of flexible material such as paper and when expanded, preferably

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forms a square or rectangular container, as best illustrated in Fig. 3, for the shipping of articles such as empty containers. Such a bag is formed with four side wall members *a*, *b*, *c* and *d*. Each of the walls *a*, *b*, *c* and *d* have their marginal bottom edges bent and folded and secured to a bottom wall member *e*. The bag A as just described is received, for example, at a can manufacturer's plant in a flattened or folded form and is used for packing empty cans or containers usually formed with a body having the bottom end secured thereto. Such cans are in a completed form (except for the top ends which are usually shipped separately) ready for filling at a cannery and therefore are packed in bags or flexible containers A by the can maker for the purpose of shipping them to the canner or packer for filling the desired product therein.

The bag opening machine embodying the present invention comprises contractable and expandable bag engaging units or mandrel parts for opening the bags A and for holding them in expanded position while they are being filled. One of the units, designated by the letter B, is a scooplke member consisting of bottom wall 11, and two opposed walls or flanges 12 which may be termed lower wings which are bent upwardly at substantially right angles to the plane of the bottom wall 11. An arm such as a rod or tubular element 13 is secured in each of the corners formed by the bottom wall 11 and the lower wings 12, as by welding. These rods extend through the depth of the scooplke member and are secured to a lower rocker shaft 14. Shaft 14 is pivotally carried in suitable bearings 15 formed in a rectangular frame 16 which comprises the main frame of the machine and has a front and rear opening. This frame 16 may be formed integrally with or mounted on a base or pedestal 17.

The other of the bag engaging units, designated by the letter C, is located above and in alignment with the unit B and comprises a pair of spaced upper wings 21. Each of the upper wings 21 is located above and adjacent one of the lower wings 12. The upper wings 21 are secured to arms such as rods or tubular elements 22, which in turn are secured at their inner ends to an upper rocker shaft 23, which is carried in suitable bearings 24 formed in the frame 16. The shaft 23 is disposed in parallel vertically spaced alignment with the shaft 14 and preferably is operated simultaneously with it. The outer or forward ends of the lower wings 12 and the upper wings 21 are cut away in a curve as at 25, so that when the units B and C are con-

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tracted, they form a wedge shape for easy entry into a partially opened bag or carrier A.

The units B and C may be operated in any suitable manner to expand and contract them. For example, a hand lever 31 (Fig. 1) is secured to a right hand extension of the lower rocker shaft 14. Rocker shaft 14 is linked to rocker shaft 23 through an interconnected linkage comprising levers or arms 32, 33, 34. There are two sets of these levers, one at each end of the shafts 14 and 23 at opposite sides of the machine (Figs. 1 and 4).

Each lever or arm 32 is secured at its lower end to the shaft 14 and is pivoted at its upper end to the lever 33, as by a pin 35. Each lever or arm 33 is connected through a pin 36 to the lower end of the lever or arm 34. Each lever 34 is secured at its upper end to the shaft 23. Thus, as the hand lever 31 is moved from the rearward position shown in Fig. 1 to the forward position of Fig. 3, the units B and C respectively secured to shafts 14 and 23 are moved from their contracted position to their expanded position.

For the purpose of restoring the units B and C to their contracted position as an incident to positioning another bag in place for opening, springs 37 are provided. One end of the spring 37 is linked to the pin 35 and the opposite end to a pin 38 secured to the outer side walls of the frame 16 at each side of the machine.

Provision is made to maintain the units B and C in their expanded position while empty cans or other articles are being filled or packed into an opened bag thru the rear opening of the frame 16 where they are arranged in a stack or column on the scoop-like member B. For this purpose latch links 42 are provided, there being one such latch link on each side of the machine (Figs. 1 and 4). Each latch link 42 is carried on the outer end of one of the pins 35. A semicircular slot 43 is formed in the lower end of each of the latch links 42 for engagement with the shaft 14 for locking the units in their expanded position. Thus as the shaft 14 is rocked by the hand lever 31 for moving the units B and C from the position shown in Fig. 1 to that in Fig. 3, the latch links 42 slide into locking position on the shaft 14 by means of the semicircular slots 43.

A leaf spring 44 is carried on each of the latch links 42 adjacent the semicircular slot 43 on a pin 45 secured in each of the links. These leaf springs hold the latch links in their locked position while the units B and C are in expanded position, as during packing of empty cans or other articles into a held opened bag or carrier. Reverse movement of the hand lever 31 from the position shown in Fig. 3 to that illustrated in Fig. 1 disengages the latch links 42 from the shaft 14. Cooperating with the action of hand lever 31, the springs 37 help to return the units B and C to their initial contracted position.

Instead of having both mandrel units B and C movable towards and away from each other, contraction and expansion of these units can also be effectively secured by having only one of the units movably mounted in the frame and having the other in fixed position.

In order to open a flattened or folded bag or container A by the machine just described, a bag A first is partially opened, as best illustrated in Fig. 2, and is slipped or telescoped over the outer ends of the units B and C when they are in their contracted position. The mouth of the

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partially opened bag then is slipped further onto the units B and C to fully open the walls of the bag. The units B and C are then shifted by the shafts 14 and 23 to swing the units to their fully expanded position (Fig. 3), thereby opening the bag or carrier into article receiving condition.

During the expansion of the units B and C each lower wing 12 cooperates with each adjoining and overlapping upper wing 21, thereby providing opposed container wall engaging supports for the opened bag, which in cooperation with the bottom wall 11 produce a hollow mandrel comprising three adjoining interior lining walls or mandrel units which support the opened bag or carrier. The walls of these mandrel units serve as guides and support the vertical stacks or columns of empty cans or containers as they are placed on the scoop-like member B and into the opened bags through the rear opening of the frame 16 and the fully opened mouth end of the bag.

The bag A upon being filled with empty cans or other articles then is slipped off of the units B and C without disturbing the arrangement of cans or other articles in the filled bag. The filled bag then may be closed and sealed at its opened end in any suitable manner whereupon the bag is ready for shipment to the cannery or other packing place.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts of the apparatus mentioned herein and in the steps and their order of accomplishment of the process described herein, without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the apparatus and process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a bag opening machine, the combination of a frame having a vertically disposed opening through which articles are passed horizontally for filling into bags held in open horizontal position, a pair of parallel horizontally disposed and vertically spaced rocker shafts comprising an upper shaft and a lower shaft both carried in said frame within said opening, each of said shafts having horizontally spaced arms projecting therefrom, a scoop-like support member secured to the arms on said lower rocker shaft and projecting outwardly from and overhanging said frame, said support member having a bottom for supporting a plurality of articles in vertically stacked relation when received through said frame opening with said bottom in substantially horizontal position, said support member also having a pair of vertically disposed lower side wings, a pair of horizontally spaced upper side wings secured to the arms on said upper rocker shaft and depending therefrom, said upper side wings being disposed in vertical position adjacent and overlapping the side wings of said support member for substantially their full length, said overlapping lower and upper side wings cooperating in guiding and holding articles in stacked relation on the bottom of said support member, and actuating means for rocking said upper and lower rocker shafts in unison for moving the projecting ends of said upper wings and said support member together for receiving a collapsed bag to be filled with articles, said actu-

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ating means also moving said upper wings away from said bottom to expand and hold said collapsed bag in open position to receive said articles.

2. In a bag opening machine, the combination of a frame having a vertically disposed opening through which articles are passed horizontally for filling into bags held in open horizontal position, a pair of parallel horizontally disposed and vertically spaced rocker shafts comprising an upper shaft and a lower shaft both carried in said frame within said opening, each of said shafts having horizontally spaced arms projecting therefrom, a scoop-like support member secured to the arms on said lower rocker shaft and projecting outwardly from and overhanging said frame, said support member having a bottom for supporting a plurality of articles in vertically stacked relation when received through said frame opening with said bottom in substantially horizontal position, said support member also having a pair of vertically disposed lower side wings, a pair of horizontally spaced upper side wings secured to the arms on said upper rocker shaft and depending therefrom, said upper side wings being disposed in vertical position adjacent and overlapping the side wings of said support member for substantially their full length, said overlapping lower and upper side wings cooperating in guiding and holding articles in stacked relation on the bottom of said

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support member, pivotally connected lever linkage interposed between said rocker shafts and providing corresponding movement of both shafts, actuating means for rocking said upper and lower rocker shafts in unison for moving the projecting ends of said upper wings and said support member together for receiving a collapsed bag to be filled with articles and for moving said upper wings away from said bottom to expand and hold said collapsed bag in open position, and latch means connected with said shaft linkage for holding said wings in expanded position to hold the bag open to receive said articles.

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