Sept. 13, 1960 T. P. GARDNER 2,952,233

STACKING MEANS

Filed April 2, 1956

Fig. 3.

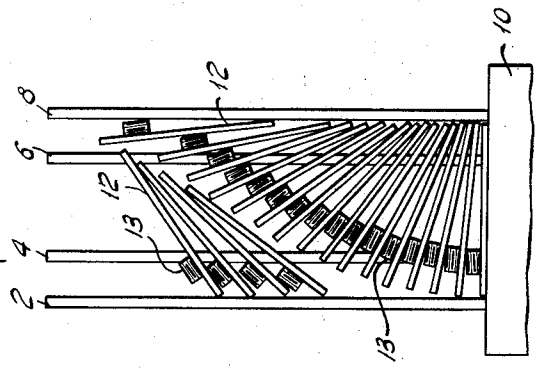


Fig. 2.

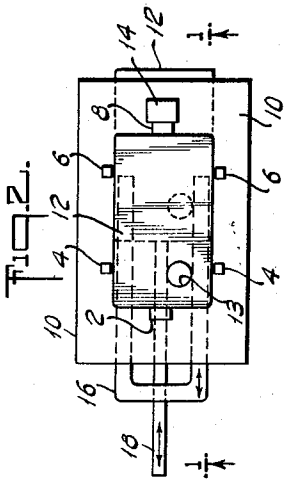
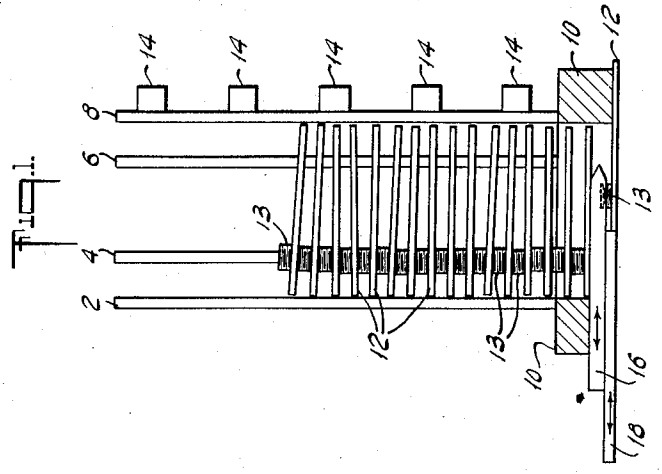


Fig. 1.



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STACKING MEANS

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4 Claims. (Cl. 113—114)

This invention relates to an improved stacking means for uneven can tops and the like. More particularly, this invention relates to an improved stacking means for uneven can tops in combination with an automatic top feeder for cans.

Previously, can tops having some protruding element, such as a neck for attaching a cap to the can, which was disposed in an off center position on the top, had to be individually hand fed to a mechanism which would then feed them to the cans. This was necessary, since these uneven can tops, owing to their unbalanced structure, could not be easily stacked even when placed in the confines of a frame to hold a stack in the vertical position.

It is an object of the present invention to provide improved stacking means for uneven can tops and the like which will allow an unlimited amount of can tops to be stacked in a relatively parallel relationship, one with the other. It is a further object of the present invention to provide improved stacking means for uneven can tops and the like which will permit a stack of can tops to be fed evenly to a feeding mechanism so that no jamming will take place therein.

These and other objects will be realized by practicing the present invention which is an improved stacking means for stacked uneven can tops comprising a stacking frame and means to produce a magnetic field adjacent the frame whereby the can tops are attracted to a side of said frame. The magnetic field has enough attracting force to hold the stacked can tops in a substantially parallel relationship while permitting movement of the stack relative to the frame. The magnetic field is preferably produced by a plurality of magnets positioned vertically along the side of the vertical frame. The magnets are preferably permanent magnets since the load does not ordinarily vary and such magnets would last throughout the life of the mechanism. Electromagnets, however, may be used whenever it is necessary to vary control of the applied attracting force. The invention includes the improved stacking means combined with a means for feeding can tops from the bottom of the stack. This feeding means comprises means for disengaging said stack from the bottom can top and means for pushing said bottom can top from beneath the stack. The disengaging means can be described as a separator member which is capable of being sequentially reciprocated between the stack and the bottom can top therein. The pushing means pushes the bottom can top out from beneath the stack while the separator member holds the remaining stack.

The invention will be further explained by the following specification and accompanying drawings in which Fig. 1 is a side sectional view along line 1—1 of Fig. 2 of the improved stacking means in combination with a feeding mechanism. Fig. 2 is a top view of the device shown in Fig. 1 and Fig. 3 is a view of a stacking means for uneven can tops not employing the features of the present invention.

In Fig. 1, a frame comprising a plurality of upright framing members 2, 4, 6, and 8 disposed in a base 10 are shown in which a stack of can tops 12, which are capable of magnetic attraction, are disposed in a relatively parallel relationship. The can tops 12 have threaded necks 13 attached thereto in an off center position on the can top as can be seen in Fig. 2. This off centered position of the threaded neck 13 ordinarily causes the can tops to assume relationships other than parallel when an attempt is made to stack them in the frame. Such a stacking arrangement can be seen in Fig. 3 wherein the lower can tops assume a rather fan shape arrangement and other can tops stacked above rest upon the top edges of the lower can tops.

The stacked can tops in Fig. 1 are shown in a relatively parallel relationship caused by a magnetic field adjacent the upright member 8 of the frame. The magnetic field is developed by magnets 14 positioned in a substantially equidistant vertical relationship along upright 8. Magnets 14 may be permanent or electromagnets. The magnets must have enough attracting force to hold said stacked can tops 12 in a substantially parallel relationship while permitting downward movement of the stack as the bottom-most can top is continuously removed from beneath the stack. The removal of the bottom-most can top is brought about by the use of two cooperating elements, namely, a separator member 16 and a pusher member 18, which are preferably sequentially activated by a cam arrangement (not shown). The separator 16 is first inserted into the stack to disengage it from the bottom-most can top by holding the stack up from this bottom can top or at least preventing the stack from interfering with the bottom can top while the pusher 18 pushes the can top out from beneath the stack and onto a waiting can. The separator 16 and pusher 18 are then retracted to allow the stack to fall down into the space from which the last bottom can top has been removed.

It can be seen in Fig. 3 that the can tops would jam the feeding mechanism, comprising the separator 16 and the pusher 18, if no means were employed to keep the individual can tops in the stack in a relatively parallel relationship. The present invention completely fulfills this purpose.

Obviously, many modifications and variations of the invention as hereinabove set forth may be made without departing from the spirit and scope thereof and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. Means for stacking in relatively parallel relationship can tops having an off center protuberance comprising the combination of directly vertical members defining a stacking frame having a cross section substantially equal to that of said can tops, and means for producing a magnetic field along one side only of said frame in a direction and with enough attracting force to cause the can tops stacked within said frame to contact said one side thereof and thereby to assume a substantially parallel relationship therewithin when said can tops are stacked with said protuberances in alignment while permitting gravitational movement of the stacked can tops.

2. In the means for stacking as defined in claim 1 said means for producing a magnetic field comprising a plurality of magnets positioned vertically and spaced uniformly along said one side of said frame.

3. An improved can top feeder for stacked can tops having an off center protuberance comprising a plurality of directly vertical members defining a stacking frame having a cross section substantially equal to that of said can tops, means for producing a magnetic field along one side only of said frame adjacent the edges of said

can tops stacked therewithin located relatively most distant from said protuberance in a direction and with enough attracting force to cause the stacked can tops to contact said one side, and to assume a substantially parallel relationship therewithin when said can tops are stacked with said protuberances in alignment while permitting downward movement of said stacked can tops relative to said frame, means for separating said stacked can tops from the bottom can top therein, and means to push said bottom can top from beneath said stacked can tops.

4. An improved can top feeder for stacked can tops having an off center protuberance comprising a plurality of directly vertical members defining a stacking frame having a cross section substantially equal to that of said can tops stacked therein, a plurality of permanent magnets positioned vertically and spaced uniformly along one side only of said frame adjacent the can top edges relatively most distant from said protuberances, said magnets being so positioned and having enough attracting force to hold the edges of a portion of the stacked can tops

in contact with said one side and in a substantially parallel relationship when said can tops are stacked with said protuberances in alignment while permitting downward movement of said stacked can tops relative to said frame, a separator member which is capable of being sequentially reciprocated between said stacked can tops and the bottom-most can top thereof, and a pusher member capable of pushing the bottom can top from beneath said stacked can tops while said separator member disengages the remaining stacked can tops therefrom.

References Cited in the file of this patent

UNITED STATES PATENTS

1,253,797	Duncan et al.	Jan. 15, 1918
1,506,099	Wilson et al.	Aug. 26, 1924
2,541,985	Chatterton	Feb. 20, 1951
2,640,605	Chatterton	June 2, 1953
2,722,936	Mathiesen	Nov. 8, 1955
2,795,340	Hommel	June 11, 1957