Dec. 28, 1943. H. L. MINAKER ET AL 2,338,048

CAN BAG UNLOADER AND CAN UNSCRAMBLING APPARATUS

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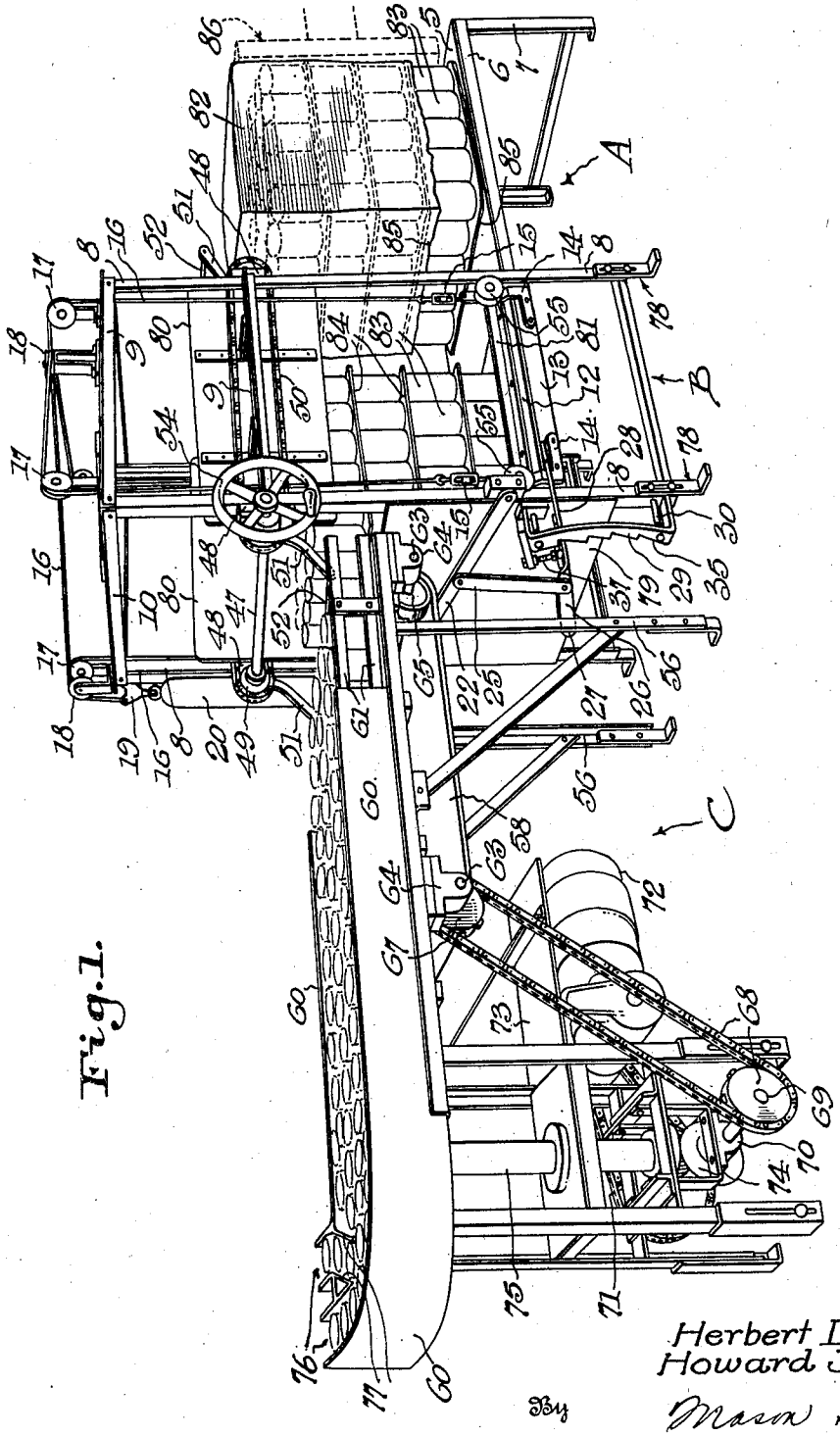


Fig. 1.

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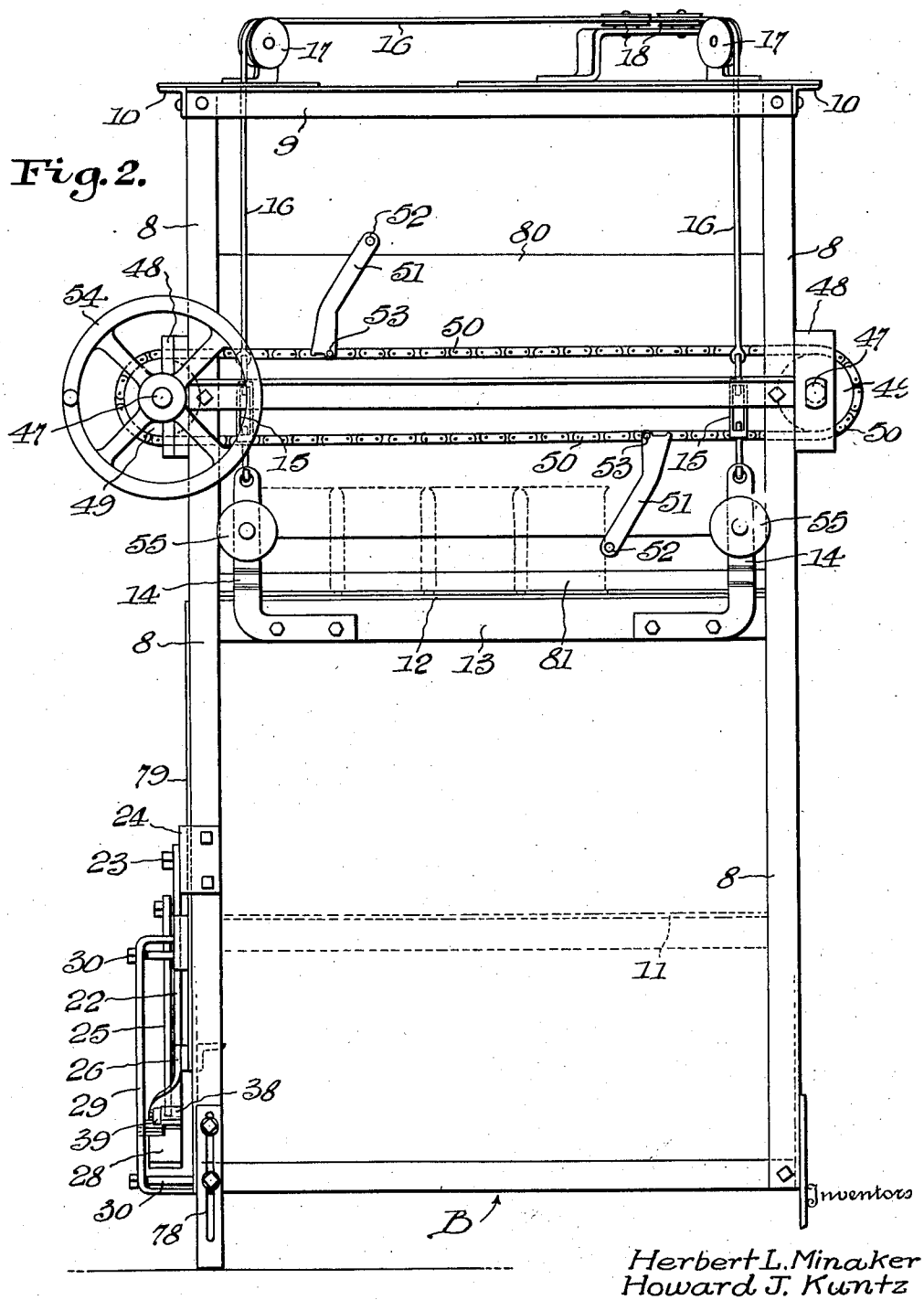
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CAN BAG UNLOADER AND CAN UNSCRAMBLING APPARATUS

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Fig. 2.



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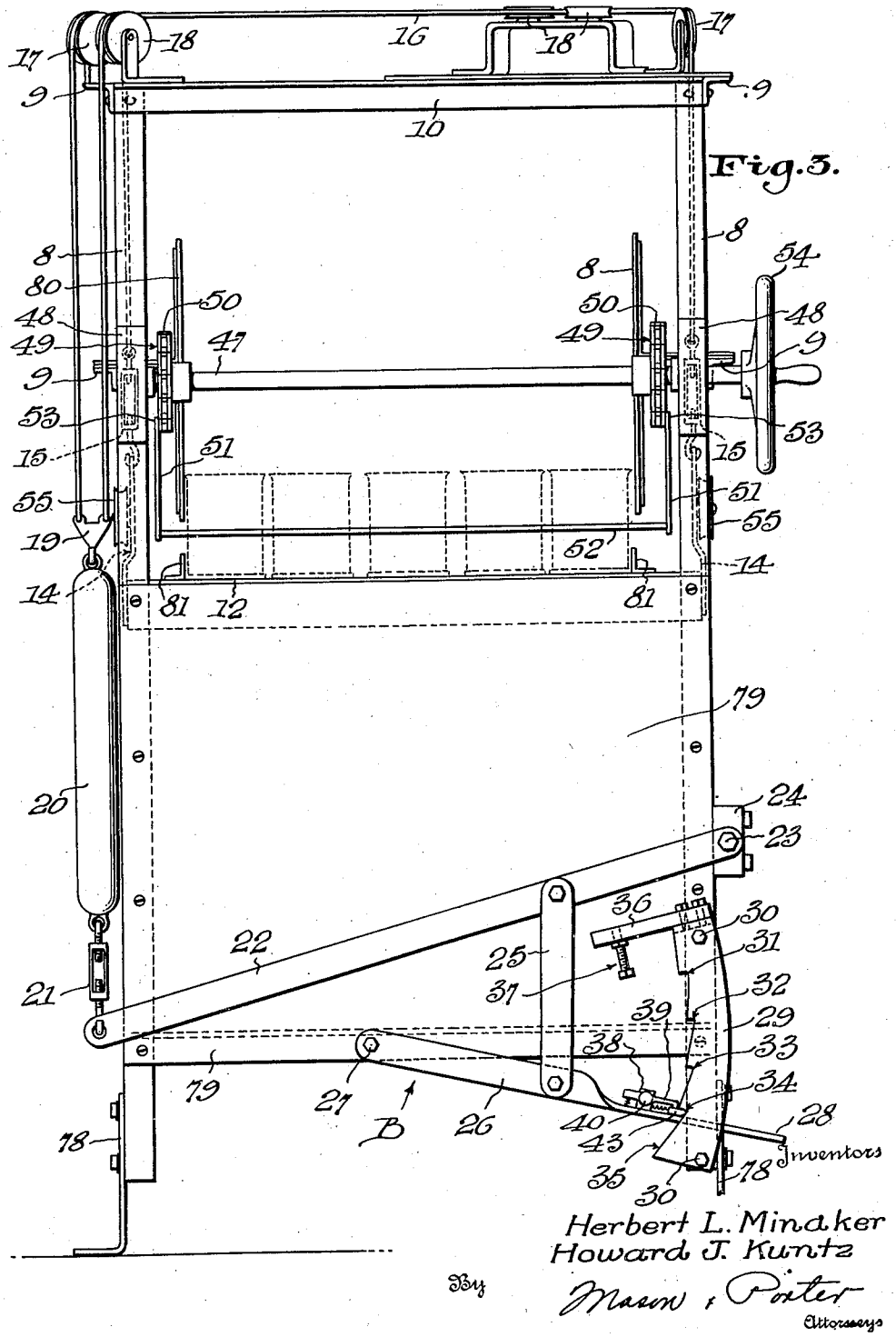


Fig. 3.

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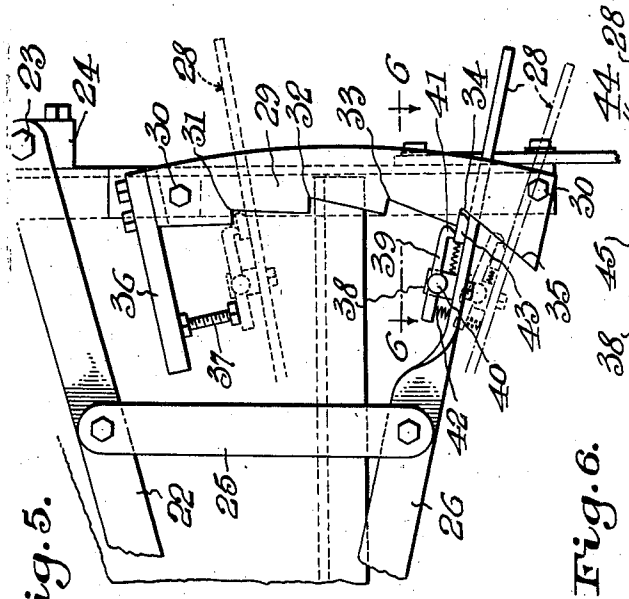


Fig. 5.

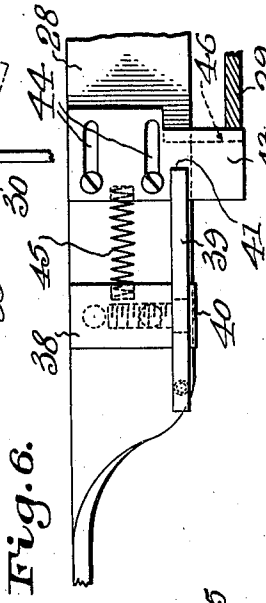


Fig. 6.

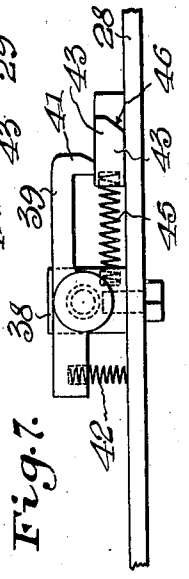


Fig. 7.

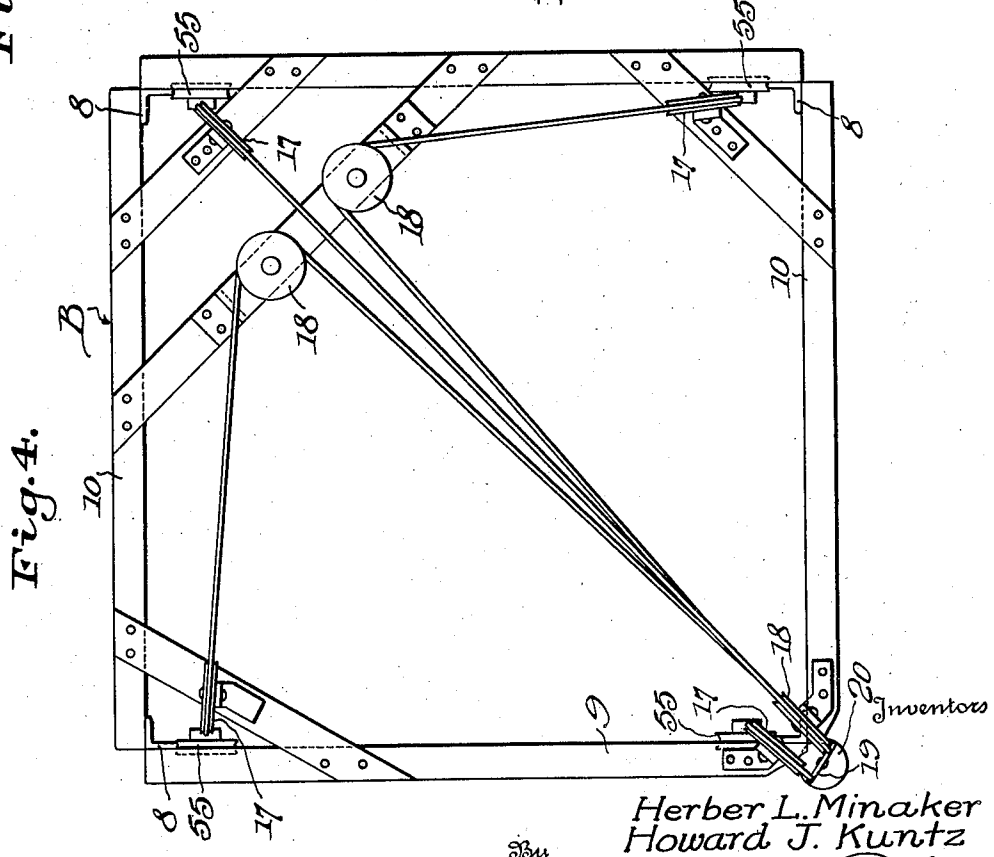


Fig. 4.

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CAN BAG UNLOADER AND CAN UNSCRAMBLING APPARATUS

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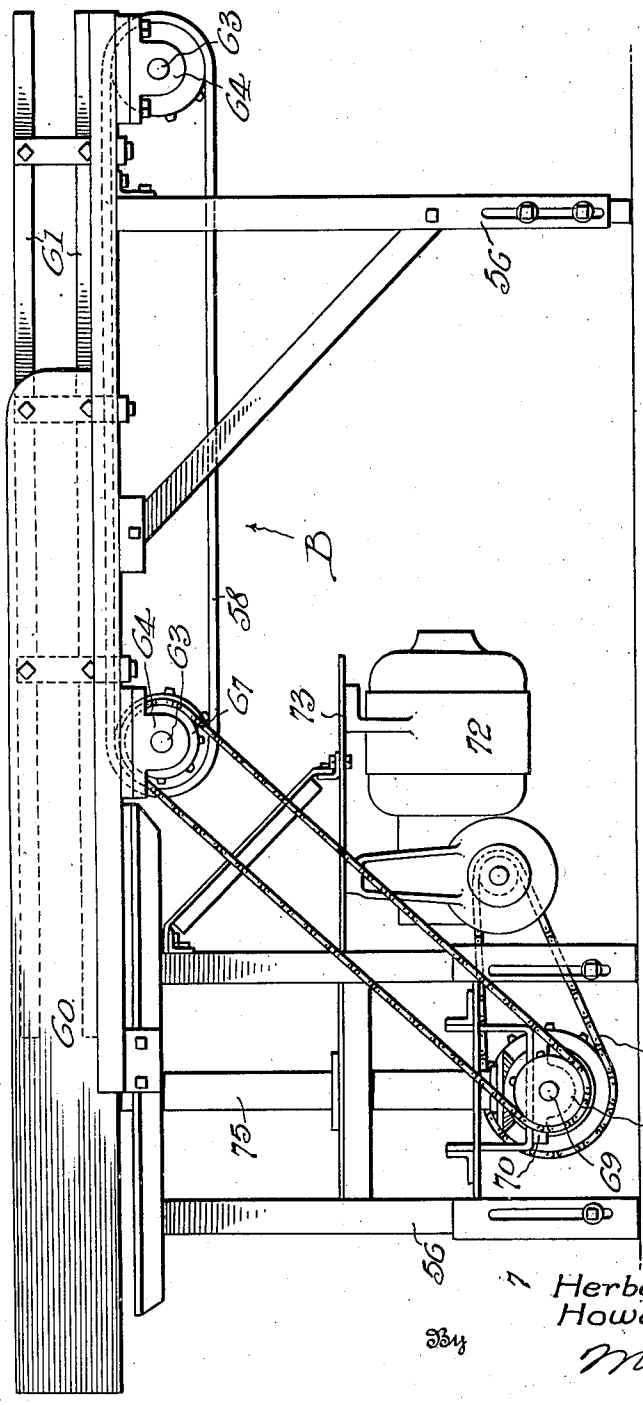


Fig. 8.

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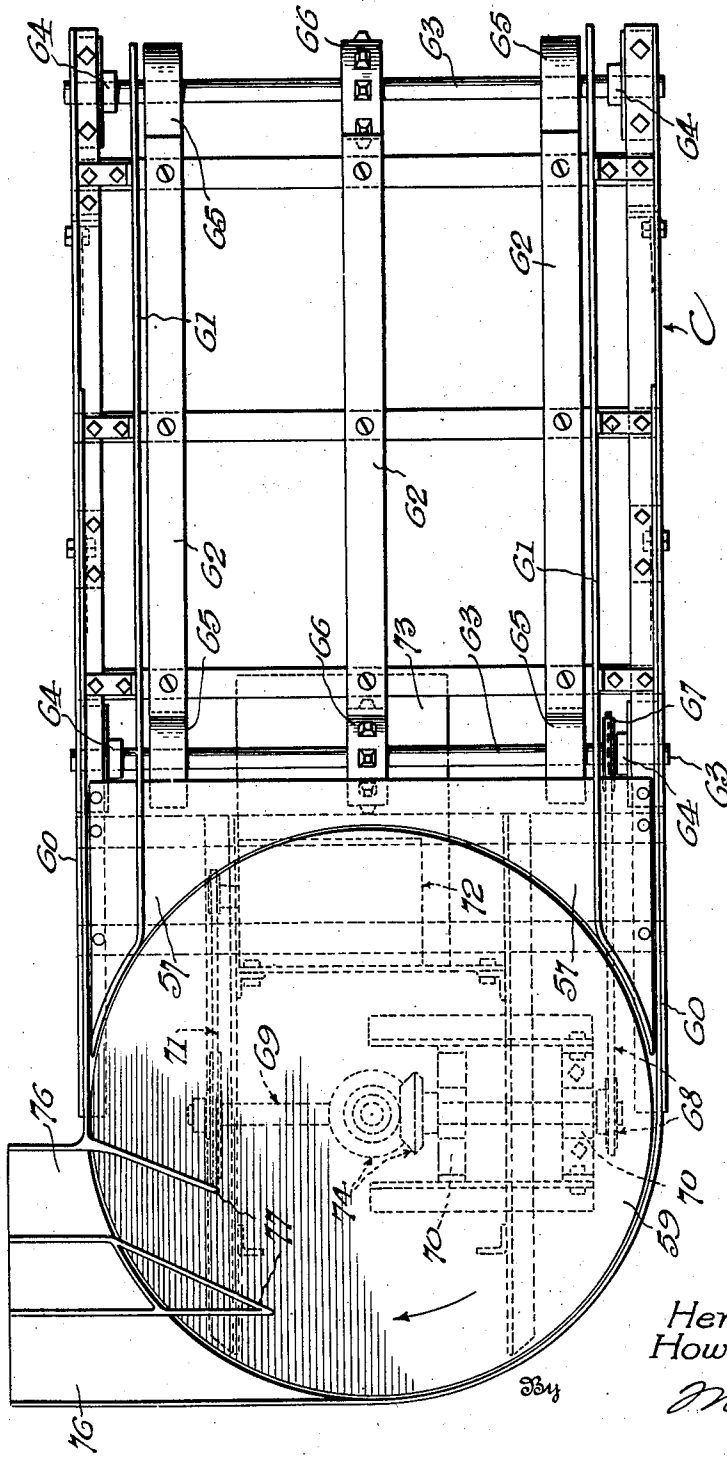


Fig. 9.

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UNITED STATES PATENT OFFICE

2,338,048

CAN BAG UNLOADER AND CAN UNSCRAMBLING APPARATUS

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Application November 29, 1940, Serial No. 367,860

8 Claims. (Cl. 214—8.5)

The invention relates generally to the art of handling cans preparatory to delivery thereof in a line or lines leading to filling or similar machines, that is, the removal of the cans from the bags or packages in which they are delivered from the manufacturer, the orderly placement of the cans on an unscrambling table, and the delivery of the cans in one or more lines from said table, and it primarily seeks to provide novel apparatus for greatly facilitating such handling.

Cans are usually packaged for delivery by the manufacturer, row beside row and tier upon tier in paper bag-like packages, the paper covering being suitably reinforced, and the superposed tiers being separated by division plates of cardboard or the like. The stripping off of the packaging material and the placement of the cans in position for being fed in lines to filling or other machines has heretofore been a troublesome and time consuming practice, and it is the purpose of the present invention to provide a novel apparatus which can be utilized to minimize the difficulties presented by and the time customarily consumed in this practice.

In its more detailed nature, the invention resides in the provision of a novel apparatus of the character stated including an unscrambling table, a support for receiving a package complement of cans arranged row beside row and tier upon tier, and novel means for elevating the support successive tier heighths to successively present the tiers for being individually pushed off onto the unscrambling table.

Another object of the invention is to provide a novel manually operable support elevating means including a novel latch equipment for securing the support at the several tier presenting levels.

Another object of the invention is to provide a latch equipment of the character stated including means for automatically releasing the latch after the highest tier elevation desired has been attained so as to permit lowering or restoration to normal of the can tier support, and means for automatically restoring the latch to effective condition when said support has been lowered.

Another object of the invention is to provide an apparatus of the character stated including a novel endless chain carried, manually operable pusher equipment for pushing the cans, tier by tier, from the support onto the unscrambling table.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more fully understood by following the detailed description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a perspective view illustrating the invention.

Figure 2 is a left side elevation of the elevator section of the apparatus.

Figure 3 is a rear end elevation of the elevator section of the apparatus illustrated in Figure 2.

Figure 4 is a plan view of the apparatus illustrated in Figures 2 and 3.

Figure 5 is an enlarged fragmentary rear elevation of the latch and detent equipment for retaining the foot treadle in adjusted positions.

Figure 6 is a detail horizontal section taken on the line 6—6 on Figure 5.

Figure 7 is an enlarged detail edge view illustrating the latch detent in the unlatched condition.

Figure 8 is a left side elevation of the unscrambling table section of the apparatus.

Figure 9 is a plan view of the unscrambling table section illustrated in Figure 8.

In the apparatus herein illustrated as an example of embodiment of the invention there are included a can package supporting section A, an elevator section B, and a can unscrambling table section C.

The can package supporting section A comprises a supporting floor 5 mounted on suitable frame bars 6 and supported at one or both ends on legs 7. This supporting section A preferably constitutes an extension from the elevator section B, as illustrated in Figure 1, but it is to be understood that this section A may be in the nature of a separate platform if desired.

The elevator section B includes a skeleton frame comprising corner uprights 8 held in rigid spaced relation by longitudinal frame bars 9 and transverse frame bars 10. A floor 11 may be supported on the skeleton frame at a level slightly lower than the level of the supporting floor 5 previously referred to, and this floor 11 is adapted to underlie an elevator platform 12 which is normally disposed on the same level with said floor 5 so as to receive with facility a package of cans arranged row by row and tier upon tier pushed thereonto from said floor 5.

The elevator platform 12 is mounted on suitable longitudinal and transverse frame bars 13, and to the longitudinal frame bars, hanger brackets 14 are secured. The brackets 14 serve as means for suspending the platform from the elevating mechanism. These brackets are connect-

ed by platform leveling turnbuckles 15 with the free ends of chains or cables 16 which take over guide pulleys 17 at the top corners of the skeleton frame, and over idler pulleys 18 also mounted above the frame top. After passing over the pulleys 17, 18 disposed at the right front corner of the skeleton frame, the chains or cables 16 have a common connection at 19 with a suspended, platform counterbalancing weight 20. The weight is in turn connected at its lower end, through the medium of a platform position adjusting turnbuckle 21, with the free end of a long actuator lever 22 which is pivotally mounted at its other end, as at 23, on a bracket 24 secured to the corner upright 8 at the front left hand corner of the skeleton frame.

The lever 22 is pivot-link connected as at 25 with a foot lever 26 which is pivoted as at 27 on the lower transverse frame member 10 at the front of the skeleton frame, and the free end of the member 26, or the portion thereof directed toward the left, considered in the direction of feed of the can tiers, or toward the right as viewed in Figure 3, is turned horizontally and extended beyond the adjacent lateral limit of the skeleton frame to form a foot treadle portion 28. The treadle portion 28 extends through an open bail-like bracket 29 which is arcuate in shape and is secured as at 30 to the adjacent frame corner standard 8. See Figs. 1, 3 and 5 of the drawings.

The arcuate edge portion of the bracket 29 presented toward the pivot 27 of the foot lever 26 is provided with four notches 31, 32, 33 and 34, in the manner best illustrated in Figures 1 and 3 of the drawings, and below the lowermost notch 34, the bracket includes a detent releasing cam portion or extension 35. The purposes of the notches and the cam portion will presently be described.

A rigid stop arm 36 extends inwardly from the top portion of the bracket 39 and carries an adjustably mounted stop screw 37. It will be obvious that by depressing the foot treadle 28, the link 25 will pull downwardly on the lever 22 and the counterweight 20 and the cable or chain ends attached thereto, thereby to exert an upward pull on the ends of the cables or chains attached to the hanger brackets 14 and effect a lifting of the elevator platform 12.

The notches 31, 32, 33 and 34 are provided to determine definite positions of elevation of the platform 12 so as to successively present individual tiers of cans in position for being moved onto the unscrambling table section C. The notch 31 determines the lowermost position of the platform 12, in which position the upper surface of this platform will lie flush with the supporting floor 5 of the supporting section A. When the platform is in this position, the top tier of cans, in this illustration the fourth tier from the bottom, will be positioned on a level for permitting it to be swept off onto the receiving surface of the unscrambling table. The notch 32 is effective to present the tier of cans second from the top, or third from the bottom, on a level with the unscrambling table, the notch 33 is similarly effective for presenting the tier of cans superposed directly upon the lowermost tier, and the notch 34 is effective to position the platform 12 flush with the receiving surface of the unscrambling section C so that the lowermost tier of cans can be moved onto said table.

A bearing block 38 is secured upon the horizontally bent portion of the lever 26 inwardly of the notched edge of the bracket 29, and a latch keeper 39 is pivoted intermediate its ends as at 40 on said block. The keeper 39 includes a detent securing nose 41, and the end of the keeper opposite the nose is yieldably held upwardly, so as to depress said nose, by a compression spring 42. The spring 42 yieldably holds the nose 41 against a spring latch or detent 43 which is slidably mounted on the treadle 28 adjacent the notched edge of the bracket 29 through the medium of the slot and pin equipments 44. The detent 43 is pressed by a compression spring 45 against the notched edge of the bracket 29 in the manner best illustrated in Figures 3, 5, 6, and 7.

It will be obvious that the detent 43 will engage the respective notches 31–34 and hold the platform against lowering movement in its respective adjusted positions brought about by depression of the treadle 28. The detent 43 includes a beveled portion 46 engageable with the cam surface 35, and when the treadle is moved downwardly far enough to cause the detent 43 to engage the cam surface 35 and be retracted thereby, the keeper nose 41 will drop over the bracket engaging edge of the detent in the manner indicated in dot and dash lines at the bottom of Figure 5, thereby to hold the detent in its retracted position and to permit the treadle to move upwardly with the detent 43 passing freely over the notches 34, 33 and 32. When the treadle reaches the upper limit of its movement indicated in dotted lines at the top of Figure 5, however, the keeper member 39 strikes the stop 37 and the nose 41 is lifted to release the detent 43 and permit it to engage the uppermost notch 31 and determine the lowermost position of the platform 12 as previously described.

Two cross shafts 47 are mounted transversely of the corner uprights 8 at the front and rear of the skeleton frame in bearings 48 provided therefor, and these shafts carry sprockets 49 connected by endless chains 50, one such conveyor chain being disposed at each side of the elevator section in the manner illustrated in Figures 1, 2 and 3 of the drawings. Two sets of laterally opposed pairs of arms 51, connected by cross pusher rods 52, are pivoted by knee-joints 53 on the chains 50 in the positions best illustrated in Figures 1 and 2 of the drawings, and one of the shafts 47 is extended and has fixed thereon a hand wheel 54 through the medium of which rotation can be imparted to the shafts 47, and a conveyor travel to the chains 50, the lower flights of these chains moving in a direction for causing one or the other of the pusher rods 52 to engage the tier of cans then presented at the unscrambling table level on the elevator platform 12 and push it onto the receiving surface of the unscrambling section C.

The hanger brackets 14 preferably support grooved guide rollers 55 which engage adjacent edge portions of the corner standards 8 and definitely guide lifting and lowering movements of the elevator platform 12. See Figures 1, 2 and 3 of the drawings.

The unscrambling table section C is mounted on vertically adjustable legs 56 and includes a fixed floor portion 57 onto which cans are delivered by an endless conveyor apron 58 and over which they pass onto a rotary unscrambling plate or turntable 59. The table includes main side walls 60 and intermediate longitudinal guide rails 61 for laterally guiding movement of the cans.

Floor rails 62 are provided for supporting the upper flight of the apron conveyor 58, and cross shafts 63 mounted in suitable bearings 64 and

equipped with pulleys 65 and sprockets 66 serve to support and impart movement to said apron. A driver sprocket 67 is mounted on one of the shafts 63 and is driven by sprocket and chain connections 68 from a cross shaft 69 mounted in bearings 70 and driven by sprocket and chain connections 71 from the motor 72 supported as at 73 on the unscrambling table framing. The shaft 69 also is drive-coupled as at 74 with the vertical shaft 75 on which the table rotor 59 is fixed.

The unscrambling table preferably includes two outlets 76 which may deliver the cans into receiving lines, and diverter guides 77 may be provided for facilitating entrance of the cans into these outlets.

The elevator section uprights 8 may also include adjustable foot portions 78 so that the elevation of the elevator section parts can be properly corelated with the parts of the supporting section A and the unscrambling table section C, and the elevator section preferably includes a backboard 79 for determining the position of a package of cans as they are pushed onto the platform 12, side plates 80 in the nature of side housing members disposed inwardly of the chains 60 but which are of a depth for not interfering with travel movement of the conveyor rods 52, and guide rails 81 mounted on the elevator platform 12 and effective to prevent lateral displacement of the cans as they are being moved off said platform. See Figures 1, 2 and 3.

In Figure 1 of the drawings a package of cans is shown as supported on the platform 5 for being pushed therefrom onto the elevator platform after the cans mounted thereon have been removed, tier by tier, onto the unscrambling table section C. The outer covering or paper in which the cans are packaged is indicated at 82, the cans at 83, and the division plates which separate the superposed tiers at 84. Preparatory to the transfer of a package of cans from the platform 5 onto the elevator platform 12, the paper covering is slit at the bottom as at 85 and removed by telescoping the same upwardly in the manner indicated in Figure 1, and when the package complement of cans previously mounted on the elevator platform 12 has been removed from the platform, the platform is again lowered into position for receiving another package complement, and then the transfer is effected manually by a suitable pusher indicated at 86.

After a package complement of cans has been pushed onto the platform 12 at its lowest level determined by the detent engagement with the bracket notch 31 in the manner hereinbefore described, the operator turns the hand wheel 54 in a direction for causing one of the conveyor bars 52 to engage behind the uppermost tier of cans and sweep it off the uppermost division plate 84 onto the apron of the unscrambling table section C. After this uppermost tier of cans has been removed, the operator removes the uppermost division plate 84 and presses the treadle 28 downwardly until the detent 43 engages under the notch 32. This positioning of the treadle 28 will dispose the third or then highest tier of cans at the level of the unscrambling table apron and the operator then again manipulates the hand wheel 54 to cause one of the cross conveyor rods 52 to sweep the tier of cans thus presented off the supporting platform and onto said apron. The now uppermost second tier of cans, and finally the lowermost tier of cans resting upon the platform 12 are successively presented by successively moving the treadle 28 to cause the detent to successively engage the notches 33 and 34, the hand wheel 54 being manipulated after each said successive notch and detent alignment to sweep said tiers of cans off the platform onto the unscrambling table.

After the lowermost tier of cans has been swept off the platform 12 onto the unscrambling apron, the treadle 28 is additionally depressed to cause the cam surface 35 to retract the detent 43 and cause the keeper nose 41 to latch it in its retracted position so that the treadle can move upwardly to its initial position illustrated in dotted lines in Figure 5 and in full lines in Figure 1, thereby to return the platform 12 to its lowered position for receiving another package complement of cans.

It is of course to be understood that the details of structure and arrangement of parts may be variously changed and modified without departing from the spirit and scope of our invention.

We claim:

1. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, guide means for laterally confining the cans of a tier as they are being pushed, and manually operable means for moving the elevator upwardly through successive can depth steps and comprising a lever and elevating means actuated thereby, a bracket engaged by the lever and having notches determining successive elevator step positions, a spring detent carried by the lever and engageable with said notches, cam actuated means for retracting the detent following removal of all cans from the elevator to permit lowering of the elevator, and means effective upon lowering of the elevator to restore the detent to its normal notch engaging position.

2. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, cooperatively engaging roller and rail means for guiding vertical movement of said elevator, means including elevator suspending cables and a counterbalance weight for supporting the elevator, and means for moving and controlling movement of the weight in opposite directions for lifting the elevator through successive steps and for again lowering it, said last named means including an actuator lever operatively connected to the elevator through said counterweight so that depression of the lever will exert a downward pull on the counterweight and effect a lifting of said elevator.

3. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, cooperatively engaging roller and rail means for guiding vertical movement of said elevator, means including elevator suspending cables and a counterbalance weight for supporting the elevator, and means for moving and controlling movement of the weight in opposite directions for lifting the elevator through successive steps and for again lowering it, said last named means including a lever, a notched bracket, a detent on the lever

engageable with the notches of the bracket, and means effective at the limit of movement of the lever in one direction for retracting the detent from cooperative relation with said notches and at the limit of movement in the opposite direction for restoring the detent to cooperative relation with said notches.

4. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, guide means for laterally confining the cans of a tier as they are being pushed, and manually operable means for moving the elevator upwardly through successive article tier depth distances and comprising a depressible lever and elevating means actuated thereby, a bracket engaged by the lever and having notches determining successive elevator step positions, and a spring detent carried by said lever and engageable with said notches.

5. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, guide means for laterally confining the cans of a tier as they are being pushed, and manually operable means for moving the elevator upwardly through successive article tier depth distances and comprising a lever and elevating means actuated thereby, a bracket engaged by the lever and having notches determining successive elevator step positions, a spring detent carried by said lever and engageable with said notches, and cam means engageable by the detent when the lever has been successively engaged with a predetermined number of said notches for automatically retracting the detent and permitting lowering of the elevator.

6. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, guide means for laterally confining the cans of a tier as they are being pushed, and manually operable means for moving the elevator upwardly through successive article tier depth distances and comprising a lever and elevating means actuated thereby, a bracket engaged by the lever and having notches determining successive elevator step positions, a spring detent carried by said lever and engageable with said notches, cam means engageable by the detent when the lever has been successively engaged with a predetermined number of said notches for automatically retracting the detent and permitting lowering of the elevator, and means effective upon completion of the lowering of the elevator to restore the detent to its normal notch engaging position.

7. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, cooperatively engaging roller and rail means for guiding vertical movement of said elevator, means including elevator suspending cables and a counterbalance weight for supporting the elevator, and means for moving and controlling movement of the weight in opposite directions for lifting the elevator through successive steps and for again lowering it and including an actuator arm pivotally supported at one end and connected at its other end to said weight, and a lever pivotally mounted at one end and link connected intermediately of its ends to the arm so that depression of the lever will lower the arm and the weight and effect a lifting of the elevator.

8. In apparatus of the character described, can tier receiving means, an elevator for successively presenting tiers of cans at the level of said receiving means, pusher means for pushing successively presented tiers of cans from the elevator onto the receiving means, cooperatively engaging roller and rail means for guiding vertical movement of said elevator, means including elevator suspending cables and a counterbalance weight for supporting the elevator, and means for moving and controlling movement of the weight in opposite directions for lifting the elevator through successive steps and for again lowering it, said last-named means including a lever, a notched bracket, a detent on the lever engageable with the notches of the bracket, and means effective at the limit of movement of the lever in one direction for retracting the detent from cooperative relation with said notches and at the limit of movement in the opposite direction for restoring the detent to cooperative relation with said notches.

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