Jan. 14, 1941. S. BERGSTEIN 2,228,943

EGG CARTON ASSEMBLING DEVICE

Filed June 16, 1939 2 Sheets-Sheet 1

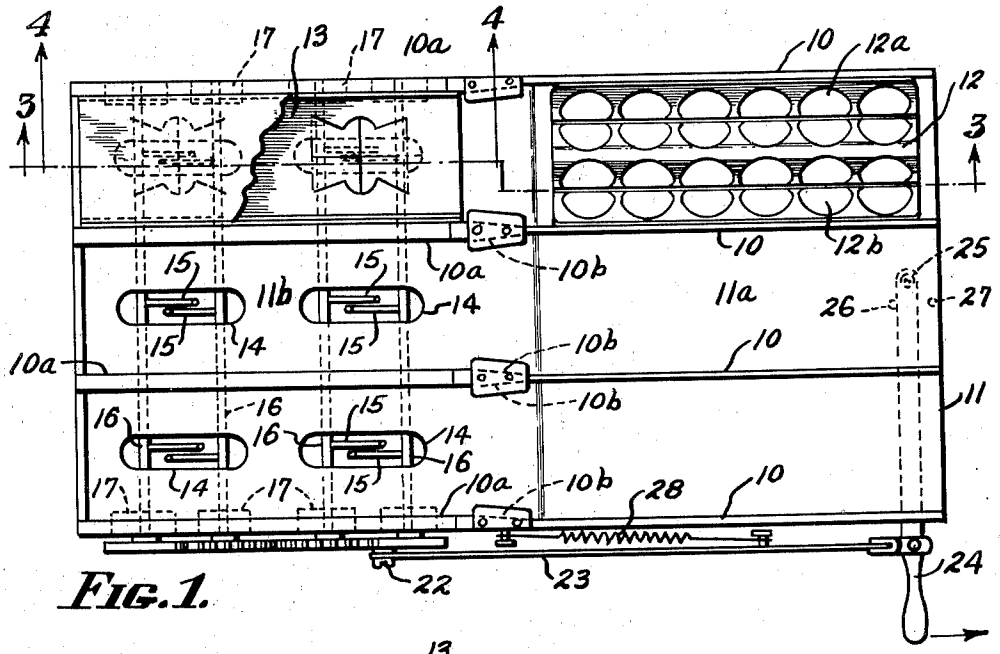


FIG. 1.

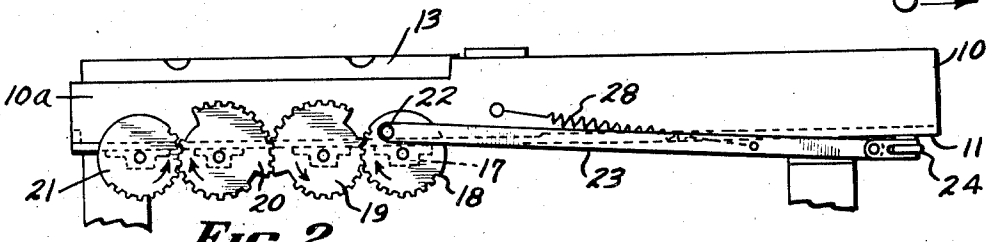


FIG. 2.

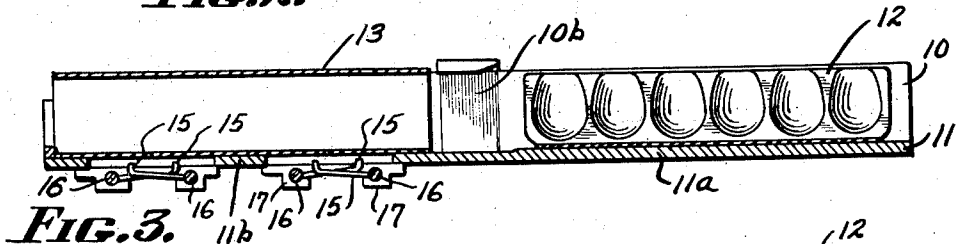


FIG. 3.

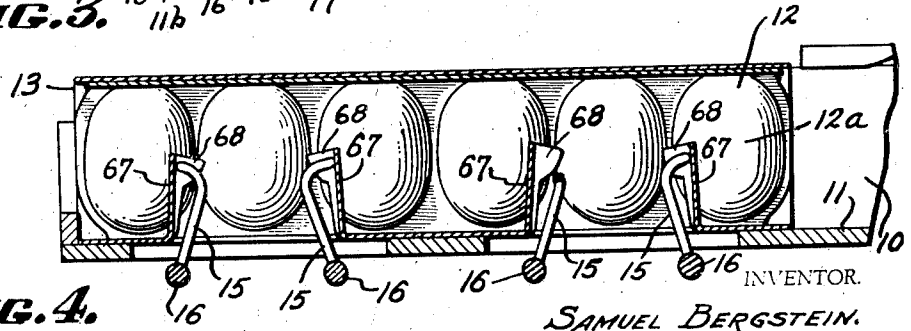


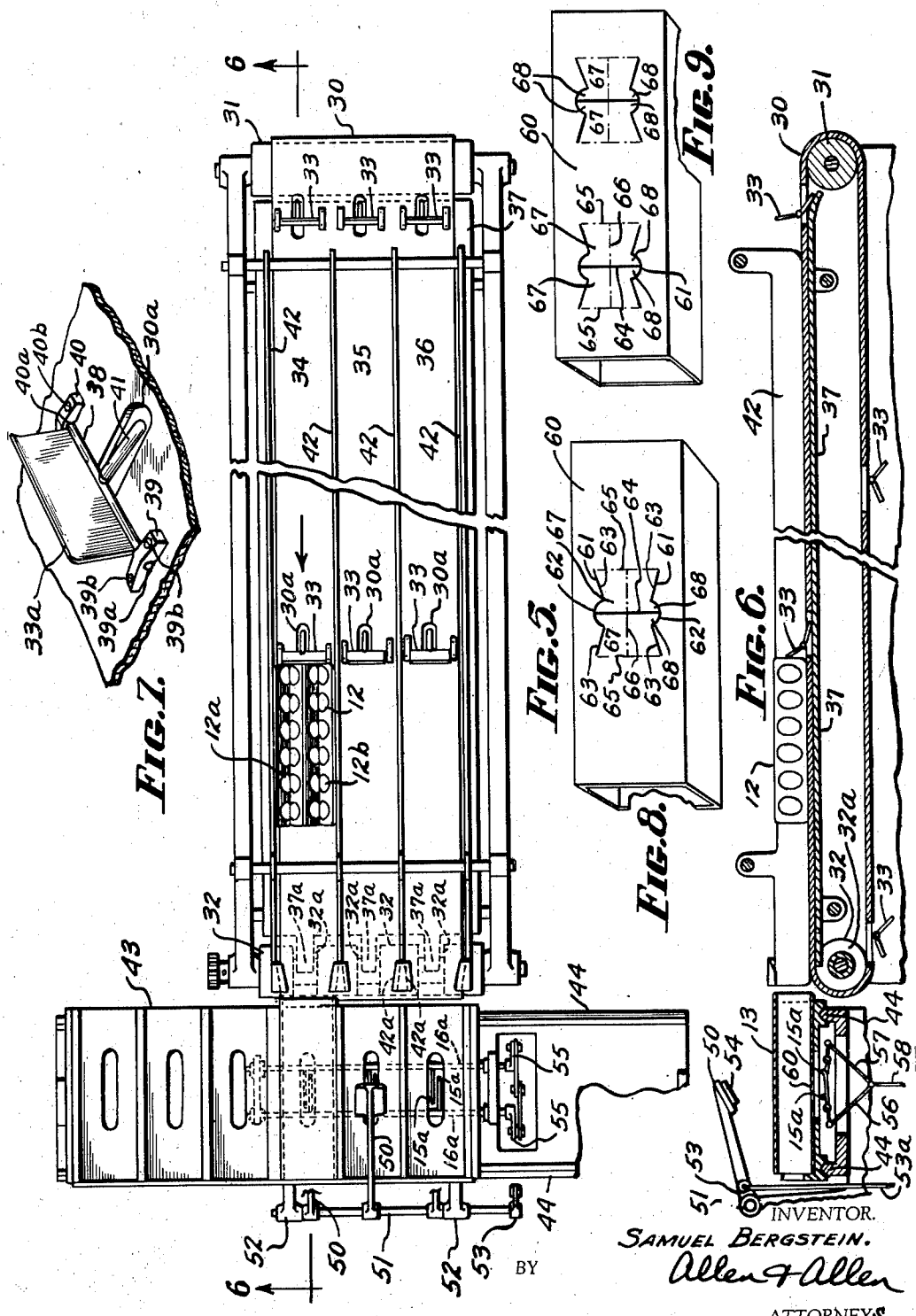
FIG. 4.

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EGG CARTON ASSEMBLING DEVICE

Samuel Bergstein, Cincinnati, Ohio

Application June 16, 1939, Serial No. 279,527

13 Claims. (Cl. 93—37)

In my United States Letters Patent No. 2,125,-042 I have disclosed an improved egg carton comprising a filler made of moulded pulp or the like, and an outer carton or sleeve. In my United States Letters Patent No. 2,100,022 I disclosed means for securing this filler within the outer carton or sleeve, and in my copending application Serial No. 220,068, filed July 19, 1938, I have disclosed method for making this carton or sleeve efficiently, and at high speed.

My present invention relates to improved devices for bringing the locking flaps of the carton into interlocking engagement with the loaded filler which is in position therein, without the need of applying adhesive, which is one of the objects of my invention. My invention further contemplates, as herein disclosed, interlocking of either a single lock or several locks in the same carton, and the carrying out of this interlocking on two or more cartons simultaneously, thereby further facilitating speed and packing time, which are further objects of my invention. Still other objects of my invention will become apparent as the description proceeds.

In the drawings:

Figure 1 is a plan view illustrating one embodiment of my invention.

Figure 2 is a side elevation of the device of Figure 1.

Figure 3 is a section taken along line 3—3 of Figure 1.

Figure 4 is an enlarged section taken along line 4—4 of Figure 1 showing the device in operative position.

Figure 5 is a plan view illustrating an alternative construction.

Figure 6 is a sectional view taken along line 6—6 of Figure 5.

Figure 7 is a fragmentary perspective showing a retractable abutment member employed in the device of Figures 5 and 6.

Figure 8 is a perspective view looking at the bottom of a carton or sleeve having a single lock.

Figure 9 is a similar view showing a sleeve with a double lock.

For purposes of simplicity in description I will hereinafter refer to the outer carton or sleeve simply as a "sleeve" although it should be understood that this sleeve may have an end closure as illustrated in Figure 9 of my Patent No. 2,125,-042, or other types of end closure if desired, the term "sleeve" being used merely for purposes of simplicity in description. I will also hereinafter refer to the inner portion, that is the filler of moulded pulp or the like, 12 in Figure 1, simply as the "filler" and it should be understood that this may be made of moulded pulp preferably, although other forms of partitions or filters might be adapted to be used in my present inventions without departing from the spirit or scope.

Referring to Figures 8 and 9, the sleeves to which my device is particularly adapted have, in their bottom panel 60, cuts 61. The cuts 61 consist of an arc-shaped middle cut 62 and adjoining cuts 63. A cut 64 extends between the curved cuts 62. Score lines 65 join the outer ends of the diverging cuts 63 and a score line 66 extends between the score lines 65. The results of these cuts and score lines is to form flaps 67, each adapted to be bent upward from the bottom 60 on its respective score line 65, and to partially collapse on its score line 66, so that its side portions diverge from this score line toward the middle of the container; while outer tabs 68, formed by the curved cuts 62, are adapted to bend further in toward each other in a direction toward the mid-length of the container. The purpose of these flaps is to fit into the inverted channel between the two members 12*a* and 12*b* of the egg holder or filler 12 after it has been fully inserted into the sleeve; to prevent it from sliding out of the sleeve. The tabs 68 are forced up between the inner exterior surfaces of opposite egg cavities as best seen in Figure 4.

Referring now to Figures 1 to 4 inclusive, the device here illustrated provides a series of guides 10, mounted on a base member 11. These guides retain the fillers 12 in upright position suitable for loading with eggs. The guides are extended as at 10*a* to retain a corresponding series of cartons or sleeves 13 in erect position. It will be noted in Figure 3 that the portion of the base 11*a* upon which the fillers rest is slightly above the portion 11*b* upon which the sleeves rest, so that as the loaded fillers are moved forward into the sleeves, they will not catch or be obstructed by the bottom panels thereof. The guides 10 have tapered portions 10*b* which serve to press the fillers slightly as they are moved forward, so that the sides of the fillers do not catch on the sides of the sleeves.

In the base member 11 a series of openings 14 are provided, through which the locking fingers 15 are arranged to operate. The fingers 15 are fixed on shafts 16 journaled in bearing brackets 17, which brackets are fixed to the under side of the base member. Gears 18, 19, 20 and 21 are fixed at the outer end of the shafts. Gear 18 has a stud 22 to which is connected a link 23 which link, at its other end, is pivotally connected to a handle or lever 24. The lever 24 is pivoted at 25 to the under side of member 11 and may be limited in its movement by pins 26 and 27. A tension spring 28 urges the assembly to the position shown in Figures 1 to 3 inclusive.

Movement of the handle 24 as indicated by the arrow in Figure 1 will revolve the shafts 16 and fingers 15 to the position shown in Figure 4.

Figure 8 illustrates one form of my carton, having a single pair of bottom locks, and Figure 9 illustrates an alternate form of carton having two pairs of bottom locks. In these forms as illustrated the carton has been squared up empty, that is, without a filler therein, and it will be seen that in this form, which is the form which the carton takes upon being squared up, the locks still lie in the plane of the bottom panel.

The device I have illustrated in Figures 1 to 4 inclusive shows an arrangement designed to lock two pairs of locks in each carton, but it is obvious that the same principle can readily be adapted for for use with cartons having only a single pair of locks, a single lock, or more than two pairs of locks, as desired. To use this device, cartons with two pairs of bottom locks as illustrated in Figure 9 are placed between the guides 10*a* to retain them in erect position, and fillers are placed between the guides 10 which hold them in erect form for filling. After the fillers have been loaded with eggs, the loaded fillers are pushed forward into the cartons.

After the loaded filler has been inserted into the carton, the shafts 16 are actuated by the lever 24, and—as shown in Figure 4—this causes all the fingers 15 to swing into operative position, the motion of these fingers serving to move simultaneously all the bottom locks of the carton, into interlocked engagement with the loaded filler therein. It is apparent that the actual actuating means, that is whether by hand lever operated motion or a foot lever, or power means, or otherwise, is immaterial, so long as motion is applied to the lever to thereby actuate the shafts through the gears. Upon being released, the spring 28 causes a return to normal or inoperative position of the fingers and shafts. The cartons with the fillers locked therein may thereupon be removed and the entire operation repeated.

It is obvious that the principles of my device may be applied to a single carton or to any desired multiple of cartons, and in the above illustrations Figures 1 and 2 show a device in which three cartons may be operated upon at one time.

Some of the features of my device that should be particularly noted—the fingers are properly spaced and located so as to be in correct position under the locks, whereby the carton is placed down into the guides preferably with an end stop to serve in locating the carton properly with no further aligning required. Also, I have provided means for supporting the loaded carton over a locking device, without interfering in any way with the operation of the locking device, and it is apparent that if desired merely narrow side plates or other supporting means could be used, instead of the openings shown, just so long as means are provided to support the carton and also means for the locking device to operate upwardly into the base of the carton. Further, by my device as shown the locking means are below the level of the carton when in inoperative position, so that no obstruction is placed in the path of the filler as it is moved into the carton, and yet by a single and simple motion a single locking device or a series of locking devices move into operative position, securely interlocking the bottom locks into the loaded filler within the carton.

Figures 5, 6 and 7 illustrate an alternate form of my device, on the same principles as the device previously shown but incorporating additional features which facilitate rapid handling and packing of the cartons to a still higher degree. In the device here illustrated I have provided a conveyor belt 30 running over rolls 31 and 32. A plate 37 supports the belt throughout its upper course of travel. At its terminus the plate has finger like portions 37*a* which extend into deep grooves 32*a* of the roll 32. Pivotally attached to the belt 30 a series of abutments generally indicated at 33 serve to carry the fillers 12 forward after they have been manually inserted in the guideways 34, 35, and 36. The construction of one of the members 33 is best shown in Figure 7. Here the abutment plate 33*a* is fixed on a rod 38 which rod is retained on the belt by the members 39 and 40. Members 39 and 40 have cut out portions 39*a* and 40*a* which allow free movement of rod 38, said members 39 and 40 being fixed to the belt by machine screws 39*b* and 40*b* which on their under side have nuts which are countersunk into the belt. Also fixed to the rod 38 is a tail piece 41, which, due to cut out portions 30*a* in the belt 30, are permitted to ride upon the surface of plate 37. The tail piece is preferably of heavy stock so that as the belt passes over the plate 37, the abutment member 33*a* is held in the position shown by gravity. Referring to Figure 6, the filler, as it passes the end of the conveyor belt will be pushed completely into the leeve 13. At this point the tail piece 41 will pass the end of plate 37 and drop downward, causing the abutment member 33*a* to rotate counterclockwise about its axis. The abutment member is thus withdrawn from interference with the bottom panel 60 of the sleeve. The guideways 34, 35 and 36 are formed by a series of plates 42 which plates have tapered portions 42*a* at their ends serving to assist the entrance of the filler into the sleeves.

The means or guides for holding the sleeves are incorporated in a reciprocating tray or table 43 mounted on ways 44. The tray 43 has provisions for receiving a double series of sleeves whereby one series may be in position for loading while another series of sleeves are being inserted.

As here illustrated the tray 43 is adapted for manual operation in its reciprocating movement, but it will be apparent that mechanical means for accomplishing this movement in timed relation with the conveyor belt could readily be provided.

Overhead arms 50 are provided above each sleeve, being mounted on a shaft 51 journaled in bearing brackets 52 and having a lever 53 at its outer end. From the lever 53 a link or rod 53*a* may extend to a foot treadle or, if desired, a cam or other mechanical device for operating same. The arms 50, when moved down against the upper panel of the sleeves, serve to hold the sleeves against upward movement during interlocking of the tabs by the fingers 15*a*. It may also be desirable to provide stamping devices on the arms 50 as indicated at 54. Thus the arms 50 serve the double purpose of retaining the carton during the locking operation, and of stamping the carton with data such as the date of packing, etc.

The locking means here shown (Figures 5 and 6) are adapted for locking cartons or sleeves having a single lock as seen in Figure 8. Here the fingers 15*a* are mounted in shafts 16*a* having at their outer ends levers or arms 55 oppositely disposed. Pivoted to the outer end of the arms 55 the links 56 and 57 may be connected to a pull rod 58 which rod may be operated by the same foot treadle or other device utilized for operating the arms 50.

All such devices may be timed to operate in desired order, that is actuated to coordinate together. As an example, as the filler moving

means moves the loaded fillers into one series of erect cartons, the overhead arm would thereupon come down to hold the cartons while the locking devices operate, this arm also dating the cartons or stamping them otherwise as desired, and upon being released this series of loaded and locked cartons move aside permitting the other series of carton holders to slide into position in alignment with the filler holders, these cartons having been inserted while the above named series of steps were taking place. Thereupon the loaded cartons are removed and empty cartons inserted while another series of loaded fillers are being inserted into the empty cartons.

I have referred in my description to the use of this device in the packing of eggs, but it is obvious that it may be adapted with equal facility to other articles. It is also apparent that modifications can be made in the particular devices described by one skilled in the art, without departing from the spirit and scope of my invention.

Having thus described my invention what I claim as new and novel and desire to secure by Letters Patent is:

1. In a carton assembling device, means for retaining a plurality of sleeves in open position, means for moving a plurality of content-containing fillers into said open sleeves, means to actuate a series of fingers against the central portions of said locking members, whereby wings of said locking members are free to fold back as said members are pressed against projections of the filler during the course of travel of said fingers.

2. In a carton assembling device, means for retaining a plurality of sleeves in open position, means for moving a plurality of content-containing fillers into said open sleeves, said sleeves having locking members adapted to engagement with said fillers, and moving means for pressing against the central portion of said locking members to permit the edges of said members to trail the course of travel of the central portions of said members as they are retarded by the projections of said fillers.

3. In a carton assembling machine, duplicate movable carton-retaining means, so arranged that one of said means is in operable position aligned with filler-guiding members, while the other of said duplicate carton-retaining means is not in operable position.

4. In a carton assembling machine, duplicate movable carton-retaining means, so arranged that one of said means is in operable position aligned with filler-guiding members, while the other of said duplicate carton-retaining means is not in operable position, each of said means having openings in the base thereof, and locking means located below said operable position, said means adapted to move through said openings to interlock cartons with the fillers therein.

5. In a device for interlocking sleeves with loaded fillers therein, means for supporting the sleeves, movable members located below the position of the sleeves and adapted to rise into engagement therewith to effect the interlocking by raising and partially collapsing portions of the sleeve inwardly thereof, and pressure means movable downwardly from above into contact with the sleeves during the operation of interlocking.

6. In a device for interlocking sleeves with loaded fillers therein, means for supporting the sleeves, movable members located below the position of the sleeves and adapted to rise into engagement therewith to effect the interlocking by moving deflectable portions of the sleeve inwardly thereof, and pressure means movable downwardly from above into contact with the sleeves during the operation of interlocking, and means interlinking the said movable members and pressure means for conjoint intermittent operation.

7. In a device for interlocking sleeves with loaded fillers therein, means for supporting the sleeves, movable members located below the position of the sleeves and adapted to rise into engagement therewith to effect the interlocking by moving deflectable portions of the sleeve inwardly thereof, and pressure means movable downwardly from above into contact with the sleeves during the operation of interlocking, said pressure means having a stamping device thereon to imprint said sleeves.

8. In a device of the character described, aligning means to retain a carton in predetermined position, and moving means to raise locking members thereof to a position substantially at right angles to a panel of said carton and a content-containing filler located within said carton arranged to deflect the edges of said locking members as they are raised thereby to conform to the contour of said filler.

9. In a device of the character described, aligning means to retain a plurality of cartons in predetermined position, and a plurality of synchronized moving means to raise locking members thereof to a position substantially at right angles to panels of said cartons, and content-containing fillers located within said cartons arranged to deflect the edges of said locking members as they are raised thereby to conform to the contour of said filler.

10. In a device for interlocking sleeves with loaded fillers positioned therein, retaining means to maintain the sleeve in erect form and moving means to fold a locking member of a panel of said sleeve to an angle relative to said panel while deflecting wings of said member into recesses of said filler.

11. In a device for interlocking a plurality of sleeves with loaded fillers positioned therein, retaining means to maintain said sleeves in erect form and multiple synchronized moving means to fold locking members of panels of said sleeves into a position at an angle relative to said panel while deflecting wings of said members into recesses of said fillers.

12. In a device for interlocking sleeves having a plurality of locking members with fillers located therein, aligning means to retain said sleeves in predetermined position and means to actuate a series of fingers against the central portions of said locking members, whereby wings of said locking members are free to fold back as said members are pressed against projections of the filler during the course of travel of said fingers.

13. In a carton assembling device, means for retaining a plurality of sleeves in open position, said sleeves having locking members adapted to engagement with said fillers, and moving means for pressing against the central portion of said locking members to permit the edges of said members to trail the course of travel of the central portions of said members as they are retarded by the projections of said fillers.

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