March 31, 1964 L. R. RICHARDS ETAL 3,126,683

SEPARATOR FEEDER

Filed June 9, 1961 4 Sheets-Sheet 1

Fig. 1.

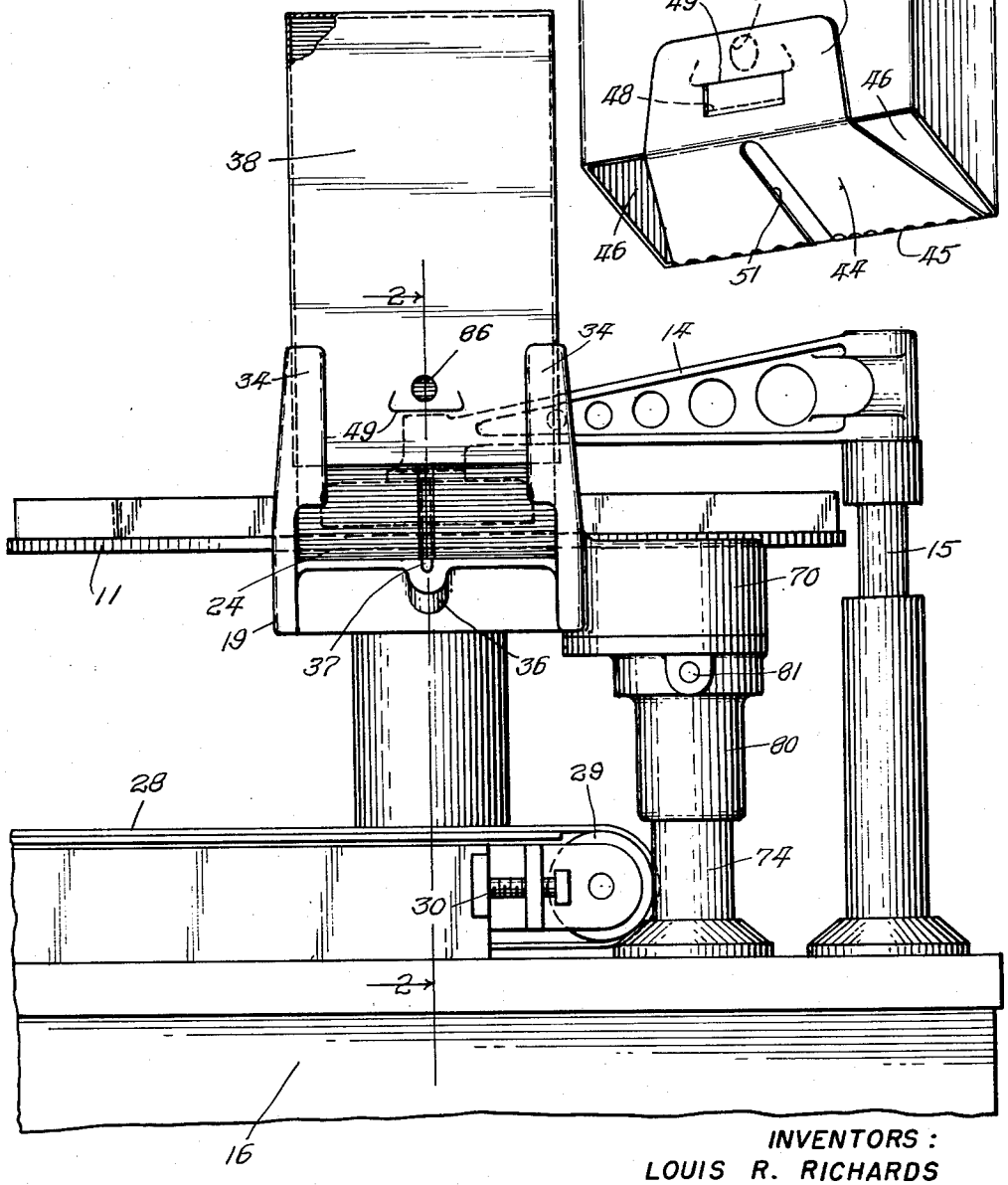


Fig. 7.

INVENTORS:
LOUIS R. RICHARDS
HARRY H. HOLLY

By Hofgren, Brady, Wegner, Allen & Stellman, Attys.

March 31, 1964 L. R. RICHARDS ETAL 3,126,683

SEPARATOR FEEDER

Filed June 9, 1961 4 Sheets-Sheet 2

Fig. 2.

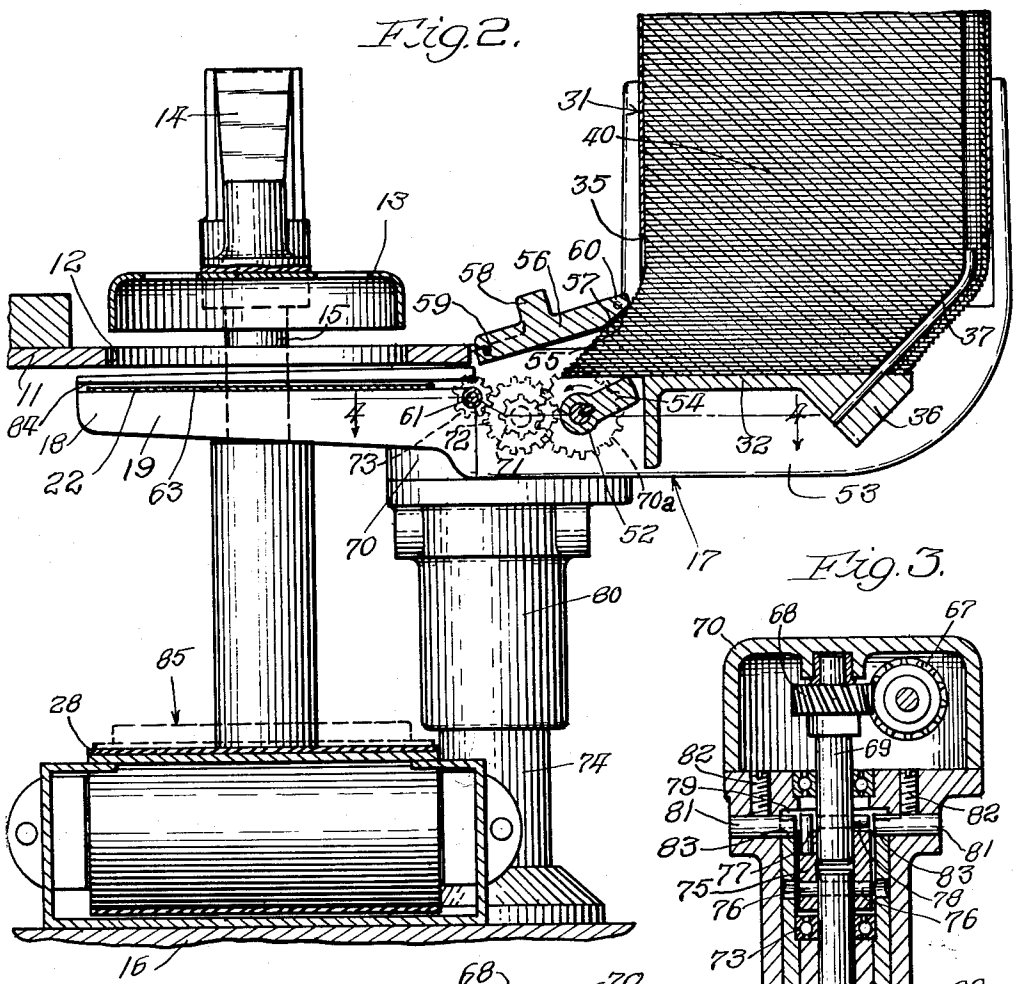
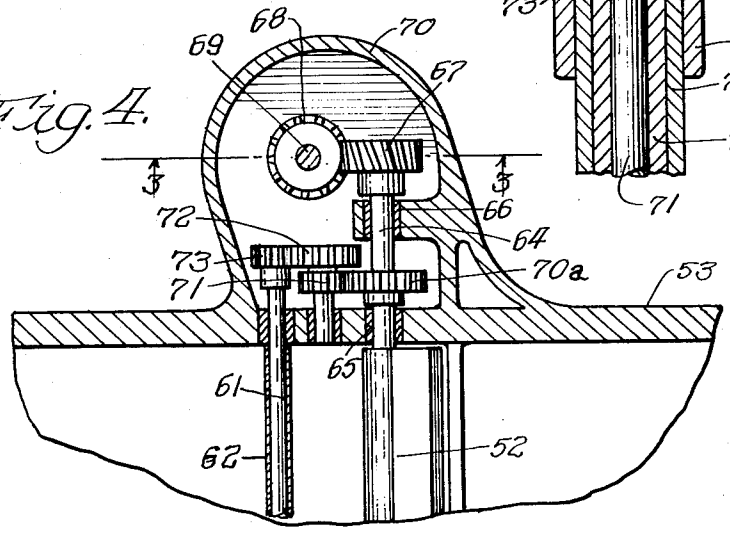


Fig. 3.

Fig. 4.



March 31, 1964 L. R. RICHARDS ETAL 3,126,683

SEPARATOR FEEDER

Filed June 9, 1961 4 Sheets-Sheet 3

Fig. 5.

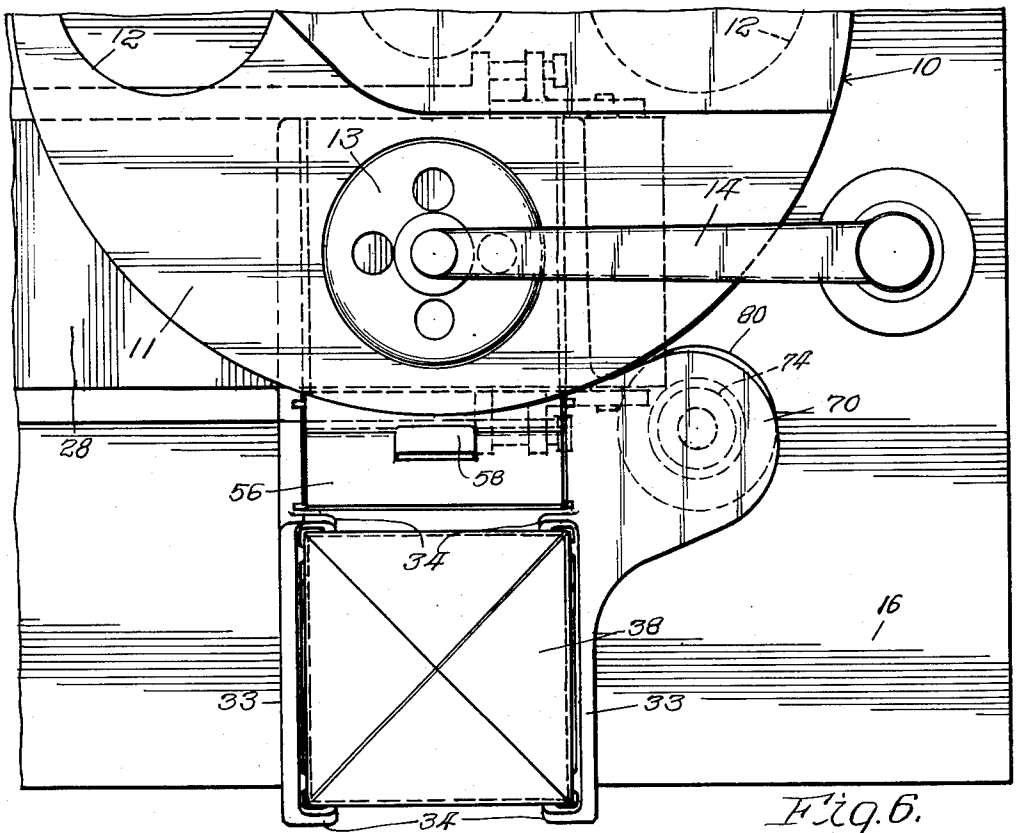
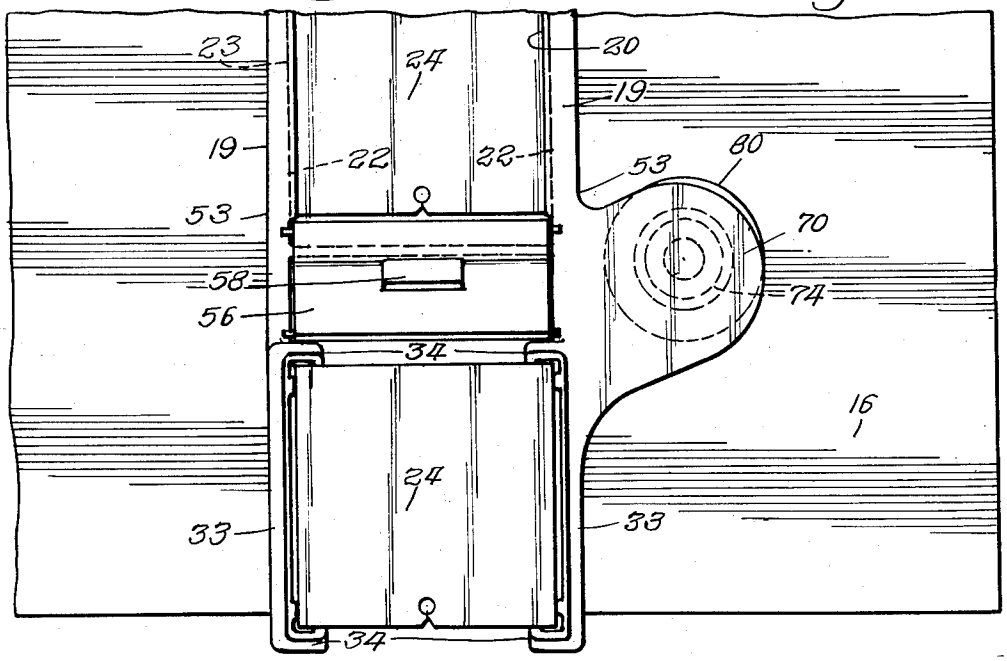


Fig. 6.



March 31, 1964 L. R. RICHARDS ETAL 3,126,683

SEPARATOR FEEDER

Filed June 9, 1961 4 Sheets-Sheet 4

Fig. 8.

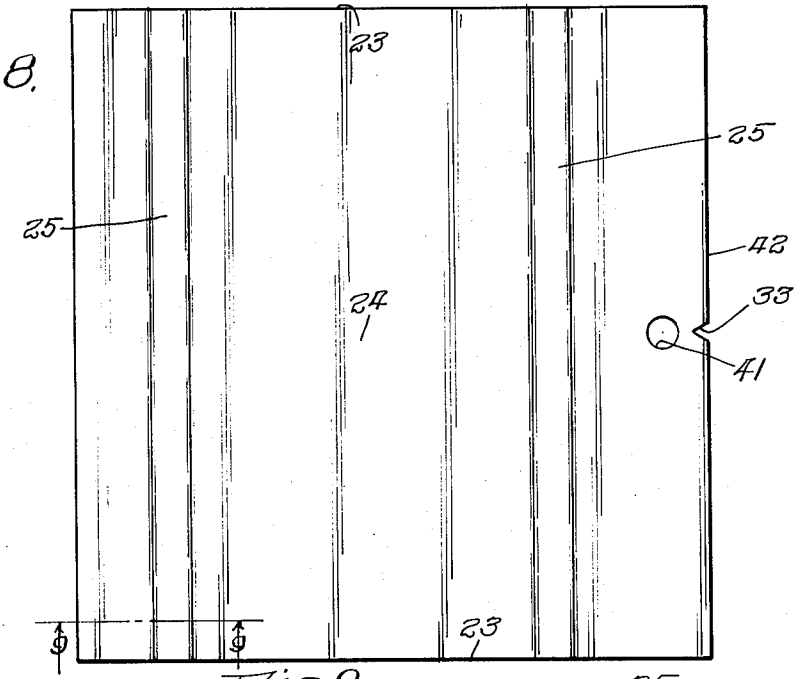


Fig. 9.



Fig. 10.

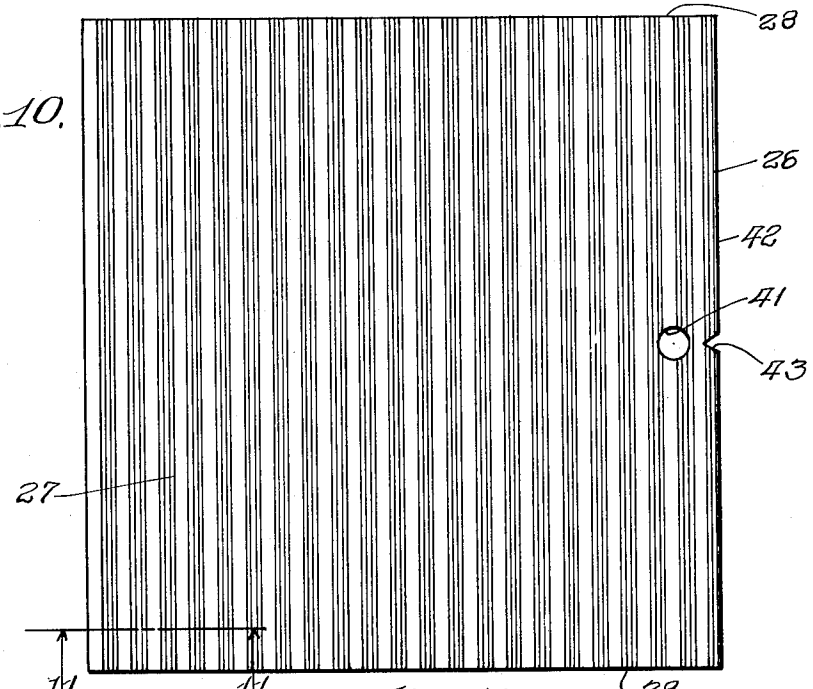


Fig. 11.



United States Patent Office 3,126,683 Patented Mar. 31, 1964

3,126,683

SEPARATOR FEEDER

Louis R. Richards, Mokena, and Harry H. Holly, Olympia Fields, Ill., assignors to Hollymatic Corporation, a corporation of Illinois

Filed June 9, 1961, Ser. No. 116,141
12 Claims. (Cl. 53—122)

This invention relates to apparatus for applying a flexible sheet such as a sheet of paper to a shaped article such as a molded article.

In many devices that serve to shape articles such as by molding the article is propelled in a path through space such as by dropping it through space with the path having a preselected direction and destination. In such devices it is also often necessary to apply a sheet such as a separator sheet of paper to the article without changing the path direction, especially where the articles are sometimes desired to be stacked and also without changing the ultimate destination. In the past this application of a sheet such as a separator sheet has been accomplished before the article has been so propelled or after the article has reached its destination. The present invention differs from these in that here the sheet is applied to the article while it is traveling through space without substantially changing the path, the speed with which it travels through space or its destination.

One of the features of this invention therefore is to provide an improved apparatus for applying a flexible sheet to a shaped article that is propelled through space with the sheet being applied after the article begins its journey and before it reaches its destination.

Other features and advantages of the invention will be apparent from the following description of one embodiment thereof as disclosed in the accompanying drawings. Of the drawings:

FIGURE 1 is a side elevational view of a sheet applying apparatus embodying the invention shown in conjunction with an article molding device.

FIGURE 2 is a vertical sectional view taken substantially along line 2—2 of FIGURE 1.

FIGURE 3 is a vertical sectional view taken substantially along line 3—3 of FIGURE 4.

FIGURE 4 is a horizontal sectional view taken substantially along line 4—4 of FIGURE 2.

FIGURE 5 is a fragmentary plan view of the apparatus of FIGURE 1.

FIGURE 6 is similar to FIGURE 5 but omitting the molding device.

FIGURE 7 is a perspective view showing the bottom of a magazine of individual sheets.

FIGURE 8 is a plan view of a typical separator sheet.

FIGURE 9 is an enlarged fragmentary sectional view taken substantially along line 9—9 of FIGURE 8.

FIGURE 10 is a plan view of a second embodiment of a sheet.

FIGURE 11 is an enlarged fragmentary sectional view taken substantially along line 11—11 of FIGURE 10.

In the illustrated embodiment of the invention there is shown purely for illustrative purposes a molding device 10 for molding patties as of ground meat, fish or the like. This molding device forms no part of the present invention as any type molding device can be used, as the apparatus of this invention applies the separator sheets to the molded articles after they have been ejected from the molding device. A molding device of the type illustrated is disclosed and claimed in Harry H. Holley Patent 3,061,872. Other devices which may also be used with the invention are disclosed in prior Holly patents of which U.S. Patent 2,787,808 is only one example.

The molding device 10, as illustrated, includes a circular plate 11 containing a plurality of mold openings 12 with these openings being adapted to contain patties of meat and the like. These patties are removed from the mold openings by a vertically movable knock-out member 13 held on the end of an arm 14 and vertically movable with a vertical shaft 15. The operating mechanism for filling the mold openings 12 with the moldable material, such as hamburger, for rotating the mold plate 11 and for dropping the member 13 and attached arm 14 when a mold opening is beneath the member 13, as illustrated in FIGURE 2, in order to remove the patty from the mold opening are all contained in an enclosing cabinet 16. The invention in this application is concerned not with the molding device but with the apparatus for applying a separator sheet to the patty after it has been removed from the opening 12 by the knock-out member 13.

The apparatus for applying the separator sheet comprises a base member 17 including on one end a frame 18 having substantially parallel sides 19 extending longitudinally on either side of the base member 17. These sides 19 are spaced apart in order to define an opening 20 through which the patty falls after being removed from the opening 12 beneath the knock-out member 13 on operation of this member. The frame sides 19 are provided with narrow facing grooves 22 on their inner surfaces with these grooves being adapted to receive the side edges 23 of a paper separator sheet 24.

Typical separator sheets are disclosed in FIGURES 8 and 9 and 10 and 11. In the embodiment in FIGURES 8 and 9 a sheet 24 is provided with two parallel thickened portions 25 extending between the edges 23 that are retained in the grooves 22. In the embodiment of FIGURES 10 and 11 the sheet 26 is slightly corrugated with the corrugations 27 running between the side edges 28 that in this embodiment would be held in the grooves 22. In both of these embodiments of the separator sheets, the sheet itself has sufficient strength to span the opening 20 between the frame sides 19 with only a minimum engagement of the sheet sides with the grooves. It is preferred that this engagement not exceed about ¼ or ⅜ inch.

This provision of only minimum engagement of the sides of the paper sheet with the supporting frame 19 is necessary for a number of reasons. The first is that the sheet should offer substantially no hindrance to the free fall of the patty to its destination which in the illustrated embodiment is a receiving belt 28. Also, in many instances with a molding device to form patties, these patties are arranged in stacks that should have as nearly straight sides as possible. By limiting the width of the sheets to only that absolutely required there is less chance of a parachuting effect occurring which would tend to cause the falling patty with the adhered sheet to deviate from its path which of course is in a preselected direction and also cause the patty to deviate from its predetermined destination which in the illustrated embodiment is on the belt 28. The width of the sheets 24 is also kept as small as possible for many additional reasons. Thus, the smaller the sheets the easier the packaging of the patties with the adhered sheets and the neater the package for any given weight of patties. This is particularly important when the device is used to prepare patties for sale in packages at frozen food counters.

There is no particularly required strength in the individual sheets as it is only necessary that they have sufficient internal strength to span the opening between the frame sides 19 without excessive overlap in the grooves 22 yet that the sheets be flexible enough, particularly at the edges, so that the weight of the patty removes the edges from engagement with the grooves without causing substantial deviation of the falling patty from its preselected destination.

As mentioned earlier, in the illustrated embodiment the patties are deposited on a conveyor belt 28. This belt may be driven continuously to deposit one patty at a time or may be driven in stepwise fashion after the deposit of a predetermined number of patties on the belt so that the patties will be in stacks of these predetermined numbers. This is a customary way for receiving patties from a molding device of this type. As can be seen in FIGURE 1 the belt 28 passes over a pulley 29 which is adjustable by means of an adjusting screw 30 and is driven at the other end of a driven pulley (not shown) in the customary manner.

The separator sheets 24 are maintained in a magazine 31 on a platform 32 at the end of the base member 17 opposite the frame 18. This supporting platform is provided with parallel upstanding sides 33 each having side flanges 34 with the pair of flanges on one side 33 facing those on the other side. Each of the sides adjacent its bottom is provided with an inwardly stepped portion 35 while the end of the platform 32 most remote from the frame 18 is provided with a thickened portion 36 which retains a pin 37. This pin at its top extends substantially vertically and then extends downwardly and forwardly toward the frame 18 to the thickened portion 36 in which it is mounted.

The magazine 31 of separator sheets comprises a paperboard box 38 with sides 39 adapted to be held between the supporting platform sides 33 as illustrated in FIGURE 5. The assembly 40 of separator sheets within the box 38 is provided with aligned edge openings as illustrated at 41 adjacent an edge 42 of the sheet that is used as the rear edge. This edge is provided with a notch 43 extending toward the opening so as to make the sheet easily tearable when an outward and rearward stress is applied to the opening 41. This construction is conventional in separator sheets of this type.

As shown in FIGURE 7 the preferred box 38 for containing the separator sheets 40 is provided with a bottom closure 44 that is joined to the sides of the box at one edge 45 by a line of perforations so as to be easily tearable from the remainder of the box. The bottom of the box is open as indicated at 46 on either side of the bottom 44 and the bottom is provided with an upwardly extending flap 47 provided with a tongue 48 attached thereto and extending into a slot 49 in the side 50 of the box. The bottom 44 of the box is also provided with an elongated slot 51 extending from the edge 45 toward but short of the flap 47.

With this construction the magazine is placed between the sides 33 of the platform and is moved downwardly until the bottom of the box sides engage the stepped portions 35 as shown in FIGURE 2. The box is so placed that the flap 47 is at the rear of the device or to the right as viewed in FIGURE 2. The operator then disengages the flap 47 from the box and tears the bottom 44 away along the line 45 of perforations so as to remove the bottom support for the sheets 40. The sheets then move downwardly with their openings 41 engaging the guide pin 37. This guide pin then directs the bottom sheets in the sheet assembly 40 forwardly toward the frame 18 or to the left as viewed in FIGURE 2. The slope of the pin 37 serves the additional purpose of making it easier to tear the sheet loose from the pin 37.

In order to move the sheets in series into the patty intercepting position in the frame 18 there is provided a rotatable or driven feeder means 52 located just forwardly of the paper supporting platform 42 and between the sides 53 of the base member 17. This feeder means or feeder member 52 is preferably made of metal such as steel and is provided with a radially extending part 54 which on rotation in a counterclockwise direction as viewed in FIGURE 2 will engage the lowermost sheet in the stack 40 to pull it toward the frame 18 and tear it loose from the pin 37.

In order to hold the projected ends 55 of the sheets

which have been urged in this projected position by the guide pin 37 against the rotating feeder member 52 there is provided a weighted cover bar 56 having an inclined rear surface portion 57 bearing against these inclined ends of the bottom sheets. This weighted bar 56 which is provided with a handle 58 has a pair of outwardly projecting hinge pins 59 on opposite ends at the forward side thereof with these hinge pins engaging corresponding depressions in the base member sides 53 as shown in FIGURE 6. The opposite side of the weighted member 56 is provided with a pair of similar pins 60 which operate as stop pins to limit downward movement of the bar 56 by engagement of these pins with the sides of the frame.

Located forwardly of the feeder member 52 or closer to the paper supporting frame 18 is a second driven feeder member 61 that is covered with a resilient rubber covering 62. With this construction the rotation of the feeder member 52 tears the lowermost sheet on the stack 40 from the pin 37 and moves it toward the grooves 22 which are open at their ends adjacent the stack 40. The second feeder member 61 serves to guide this lowermost sheet 63 into the grooves 22 with the edges, illustrated at 23 in the embodiment of FIG. 8 and 28, in the embodiment of FIG. 10, of the sheet being held in these grooves.

As mentioned earlier, both of the feeder members 52 and 61 are driven. Thus the first feeder member 52 is mounted on a shaft 64 which extends through bearings 65 and 66 that are spaced from each other. On the extreme end of this shaft 64 there is located a gear 67 which is arranged vertically and which engages another horizontal gear 68 that is mounted on a shaft 69.

The second feeder member 61 is driven from the first feeder member shaft 64 through a train of gears 70*a*, 71, 72 and 73. This train of gears plus the gears 67 and 68 are contained within a side housing 70 on the shaft feeding apparatus.

The feeder members 52 and 61 and their gears are driven by the vertical shaft 69. This vertical shaft which is a subshaft is in turn driven by an aligned main shaft 71 which is itself driven by the mechanism (not shown) in the cabinet 16. This main shaft extends through a tube 72 and has its top journalled in bearings 73. Surrounding the tube 72 is a second tube 74. Attached to the top of the shaft 71 and extending upwardly therefrom is a collar 75 with the attaching being by means of a pin 76 passing through both the collar 75 and the top of the shaft 71. The bottom of the shaft 69 which is concentric with the shaft 71 extends into the top of the collar 75. The collar is provided with an upwardly extending pin 77 with this pin adapted to engage a horizontal pin 78 extending outwardly from the bottom of the shaft 69. Extended ends of both pins 77 and 78 are located in a chamber 79 at the top of the collar 75 and within a downwardly directed cylindrical extension 80 of the housing 70. This extension 80 is movable with respect to the outer surface of the outer tube 74 and is provided with a pair of diametrically opposite inwardly extending pins 81 each fastened in position by means of a set screw 82. The inner ends of these pins 81 also extend into the chamber 79 and rest in notches 83 in the top of the outer tube 74.

The operation of the apparatus is as follows: The feeder members 52 and 61 are rotated in timed relationship to the operation of the patty molding device 10 by mechanical linkages (not shown) so that a sheet of separator paper 63 is always in position in the frame 18 when a patty filled opening 12 is beneath the knock-out member 13 and just before the knock-out member is used to remove the patty from the opening 12. This operation of the device and similar molding devices is described in the above-mentioned issued patents as well as other issued patents of Harry H. Holly which have issued over the last several years. In order to insure that the separator

paper 63 is always in position, this timing relationship is maintained through the usual types of gearing.

In order to propel a lowermost sheet of paper 63 into position in the grooves 22 in the frame sides 19, the main shaft 71 is rotated and this in turn rotates the collar 75 by means of engagement of the pins 77 and 78. This engagement of the pins causes rotation of the shaft 69 which in turn rotates the gears within the housing 70. The resulting rotation of the second feeder member causes the first feeder member extending part 54 to engage a lowermost sheet in the stack 40 and pull it to the left as shown in FIGURE 2 and tear it loose from the pin 37. This movement of the lowermost sheet of paper is assured by weighted member 56 holding the paper against the feeder means. This first feeder means 52 after tearing the lowermost sheet of paper loose propels it into engagement with the rubber covering 62 of the second feeder member 61 which then propels the paper into the grooves 22 as previously described. The ends of these grooves are closed as indicated at 84 in order to limit the extent of movement of the paper sheet and position it properly under a mold opening 12 which is under the knock-out member 13.

The knock-out member is then lowered by the usual mechanism to knock the patty from the opening 12. The falling patty then falls through the opening defined by the side member 19 and picks up the sheet of paper 63 on its bottom and the two together fall onto the belt 28 as indicated at 85.

The entire separator sheet applying device may be easily removed from the machine whenever such is desired. Thus all that is necessary is to lift upwardly on the housing 70 causing the housing extension 80 to slide upwardly on the outer surface of the tube 74. This upward movement is continued until pins 81 clear the tops of the notches 83. The housing 70 is then swung around until the frame 18 is out from under the mold plate 11. The entire assembly including the assembly 70 may then be lifted from the tube 74. To reinstall the apparatus it is only necessary to repeat these steps in reverse.

As mentioned earlier, the assembly 40 of paper within the box 38 constitutes a magazine of separator sheets. The installation of this magazine on the platform 32 between the sides 33 has been previously described. When the sheets within the box 38 are almost exhausted this can clearly be observed through a small opening 86 in the side of the box which before the magazine is placed in use is hidden by the flap 47. When the inspection indicates that the magazine is approaching an empty condition it is only necessary to remove the former box 38 and insert a filled magazine in the manner previously described.

As can be seen from the above description, both the individual separator sheets 63 and the magazine 31 form the necessary parts of the mechanical combination. For the reasons given earlier, the sheet 63 is made as small as possible and therefore only a minimum overlap is used to extent within the holding grooves 22. Furthermore, because nothing must interfere with the preselected path, direction and destination of the falling patty, the sheets 63 must be self-supporting. However, it must also have flexible enough edges so that the edges can be bent in pulling out of the grooves without substantial deflection of the falling patty.

Similarly, the box 38 of the magazine 31 forms a necessary part of the combination as this box is necessary in order to hold the sheets against lateral displacement so that they can be fed by gravity onto the pin 37 which propels them forwardly into position to be engaged in series by the feeder members 52 and 61 in the manner previously described. Thus the sides 33 of the platform are for retaining the magazine in proper position while the box forms a part of the magazine which actually retains the sheets and guides them in their gravity movement.

Having described our invention as related to the embodiments shown in the accompanying drawings, it is our intention that the invention be not limited by any of the details of description, unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

We claim:

1. In an article shaping device in which an article is shaped, apparatus comprising: means for propelling said shaped article from said apparatus in a free falling path through space, said path having a preselected direction and destination; means including a frame defining an opening in said path through which said free falling shaped article passes from said propelling means, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; and means for moving said sheet from exteriorly of said path into said frame engaging position prior to said article passing through said opening.

2. In an article shaping device in which an article is shaped, apparatus comprising: means for propelling said shaped article from said apparatus in a free falling path through space, said path having a preselected direction and destination; means including a frame defining an opening in said path through which said free falling shaped article passes from said propelling means, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; means for providing a stack of said sheets adjacent said frame; and means for periodically feeding a sheet from said stack into said frame engaging position prior to an article passing through said opening.

3. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having a pair of opposite side members each having means forming a slot with the slots facing each other across said opening and said slots being adapted to engage the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; and means for moving said sheet from exteriorly of said path into said frame slot engaging position prior to said article passing through said opening.

4. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; means for providing a stack of said sheets adjacent said frame; and driven means periodically engaging an end sheet on said stack for moving said sheet from said stack into said frame engaging position prior to an article passing through said opening.

5. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of

said frame, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; means including side supports for retaining a supply of said sheets in an upstanding stack adjacent said frame; and driven means periodically engaging a lowermost sheet on said stack for moving said sheet from the bottom of said stack into said frame engaging position prior to an article passing through the opening.

6. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; a platform adjacent said frame; upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; and driven means periodically engaging a lowermost sheet on said stack for moving said sheet from the bottom of said stack into said frame engaging position prior to an article passing through the opening.

7. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; a platform adjacent said frame; upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; a sheet engaging member on said platform on the side opposite said frame adapted to engage aligned openings in the edges of said sheets at the bottom of said stack on the side thereof opposite said frame, said sheets being easily tearable at said openings and said sheet engaging member being inclined downwardly and forwardly toward said frame to project the edges of said bottom sheet adjacent said frame toward the frame; and driven means periodically engaging a lowermost sheet on said stack for moving said sheet from the bottom of said stack into said frame engaging position prior to an article passing through the opening.

8. The apparatus of claim 7 wherein said driven means engages said lowermost sheet on the bottom thereof adjacent said frame.

9. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having means for engaging the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; a platform adjacent said frame; upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; a sheet engaging member on said platform on the side opposite said frame adapted to engage aligned openings in the edges of said sheets at the bottom of said stack on the side thereof opposite said frame, said sheets being easily tearable at said openings and said sheet engaging member being inclined downwardly and forwardly toward said frame to project the edges of said bottom sheet adjacent said frame toward the frame; a driven rotatable member periodically engaging the bottom of a lowermost sheet on said stack for urging said sheet toward said frame engaging position prior to an article passing through the opening; means engaging said projecting sheet edges to retain said lowermost sheet for driven engagement by said rotatable member; and a second driven rotatable member engaging said urged sheet for moving said sheet into frame engaging position.

10. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having a pair of opposite side members each having means forming a slot with the slots facing each other across said opening, said slots being adapted to engage the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; a platform adjacent said frame, said slots being substantially parallel, extending away from said platform and having open ends adjacent said platform, upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; a sheet engaging member on said platform on the side opposite said frame adapted to engage aligned openings in the edges of said sheets at the bottom of said stack on the side thereof opposite said frame, said sheets being easily tearable at said openings and said sheet engaging member being inclined downwardly and forwardly toward said frame to project the edges of said bottom sheets adjacent said frame toward the frame; and driven means periodically engaging a lowermost sheet on said stack for moving said sheet from the bottom of said stack into said frame engaging position prior to an article passing through the opening.

11. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having a pair of opposite side members each having means forming a slot with the slots facing each other across said opening, said slots being adapted to engage the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substanially changing said path; a platform adjacent said frame, said slots being substantially parallel, extending away from said platform and having open ends adjacent said platform; upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; a sheet engaging member on said platform on the side opposite said frame adapted to engage aligned openings in the edges of said sheets at the bottom of said stack on the side thereof opposite said frame, said sheets being easily tearable at said openings and said sheet engaging member being inclined downwardly and forwardly toward said frame to project the edges of said bottom sheet adjacent said frame toward the frame; a driven rotatable member periodically engaging the bottom of a lowermost sheet on said stack for urging said sheet toward said frame engaging position prior to an article passing through the opening; means engaging said projecting sheet edges to retain said lowermost sheet for driven engagement by said rotatable member; and a second driven rotatable member engaging

said urged sheet for moving said sheet into frame engaging position.

12. In an article shaping device in which an article is first shaped and then propelled in a free falling path through space, said path having a preselected direction and destination, apparatus comprising: means including a frame defining an opening in said path through which said shaped article passes from a source externally of said frame, said frame having a pair of opposite side members each having means forming a slot with the slots facing each other across said opening, said slots being adapted to engage the opposite edges of a flexible sheet to retain the sheet in said frame to span said opening in article intercepting position, the article thereby picking up the sheet and carrying it to said destination without substantially changing said path; a platform adjacent said frame, said slots being substantially parallel, extending away from said platform and having open ends adjacent said platform; upwardly extending side supports on said platform, said platform and supports being adapted to support a stack of sheets; a sheet engaging member on said platform on the side opposite said frame adapted to engage aligned openings in the edges of said sheets at the bottom of said stack on the side thereof opposite said frame, said sheets being easily tearable at said openings and said sheet engaging member being inclined downwardly and forwardly toward said frame to project the edges of said bottom sheet adjacent said frame toward the frame; a driven rotatable member periodically engaging the bottom of a lowermost sheet on said stack for urging said sheet toward said frame engaging position prior to an article passing through the opening; weighted means engaging said projecting sheet edges at the top thereof to retain said lowermost sheet for driven engagement with said rotatable member; and a second driven member between said open slot ends and the first driven member engaging said urged sheet for moving said sheet edges into said slots.

References Cited in the file of this patent

UNITED STATES PATENTS

533,516	Williams	Feb. 5, 1895
1,913,642	Smith	June 13, 1933
2,547,892	Stevens	Apr. 3, 1951
2,684,501	Holly	July 27, 1954
2,704,599	Tuttle et al.	Mar. 22, 1955
2,845,763	Wonsidler	Aug. 5, 1958
2,851,836	Fromwiller	Sept. 16, 1958
2,877,014	Meyer	Mar. 10, 1959
2,981,042	Gentry	Apr. 25, 1961