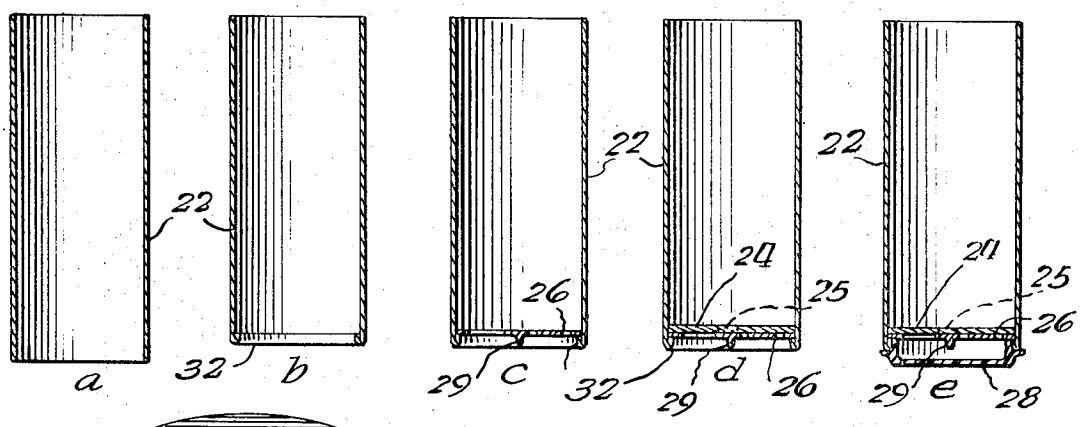
Nov. 10, 1970 L. GALOCKIN ET AL 3,538,583

MACHINE FOR ASSEMBLING SIFTER TOP PACKAGES

Filed July 5, 1968 4 Sheets-Sheet 1

Fig. 3



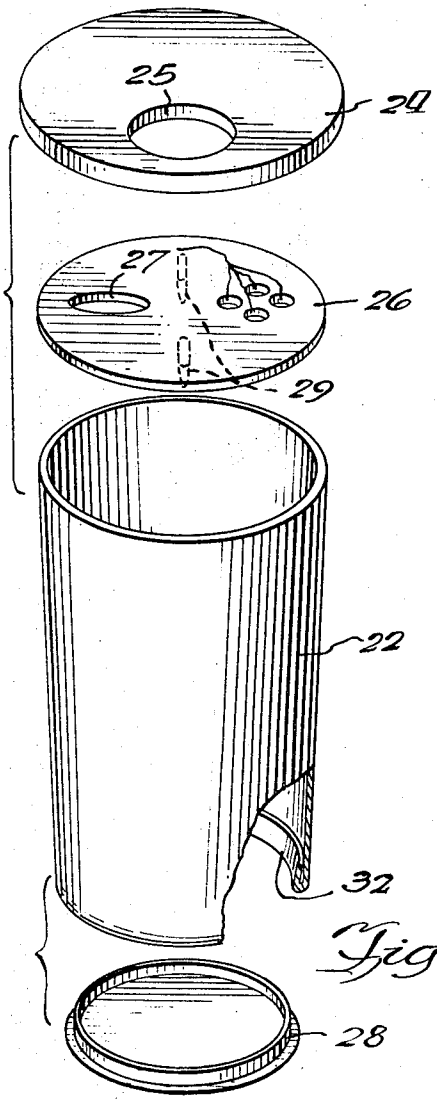


Fig. 2

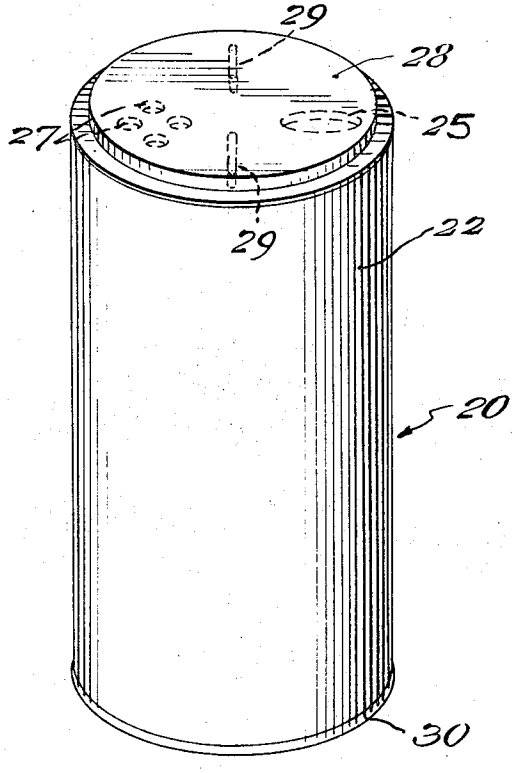


Fig. 1

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MACHINE FOR ASSEMBLING SIFTER TOP PACKAGES

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Fig. 4

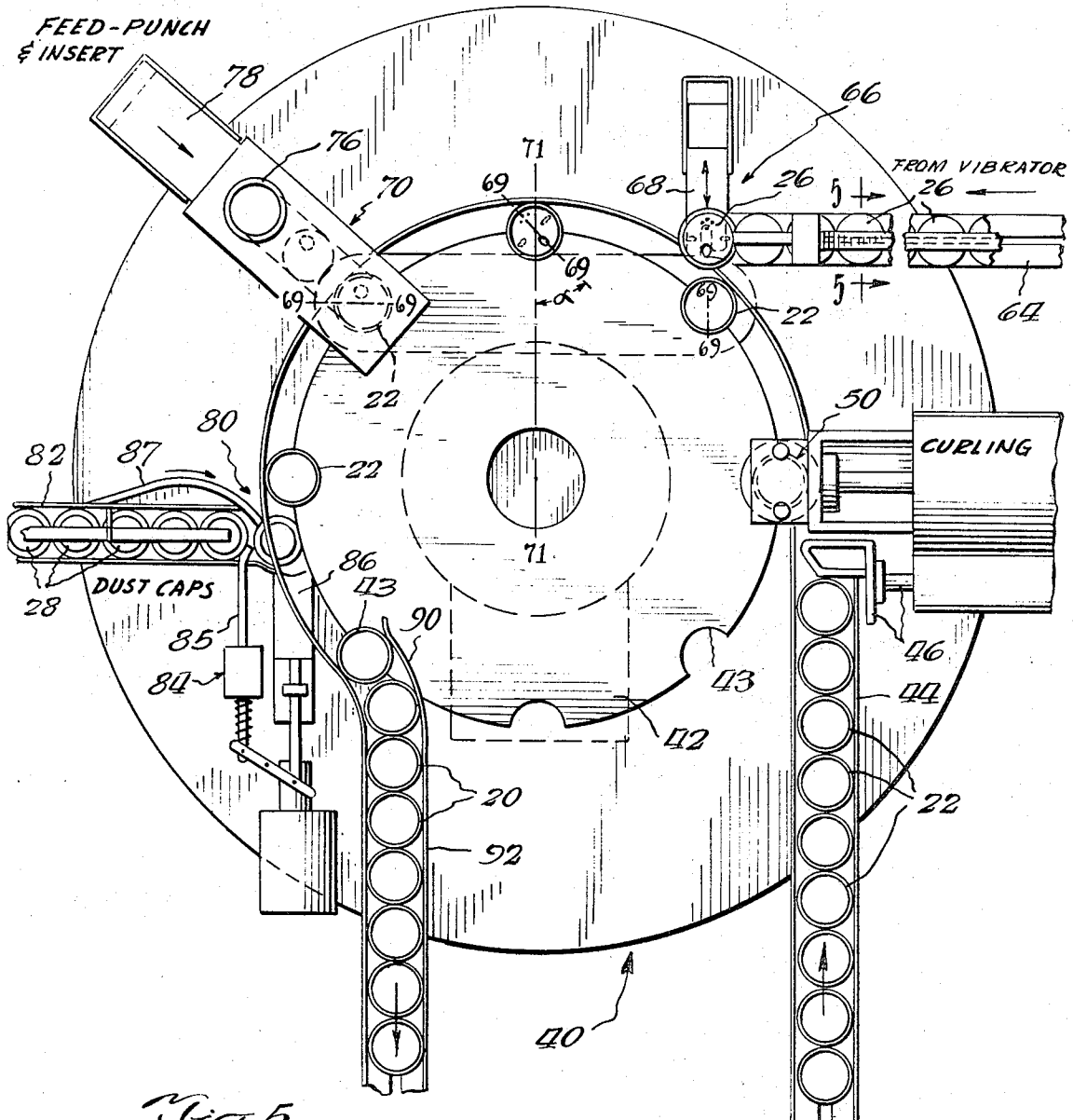
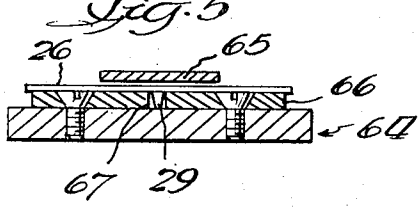


Fig. 5



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MACHINE FOR ASSEMBLING SIFTER TOP PACKAGES

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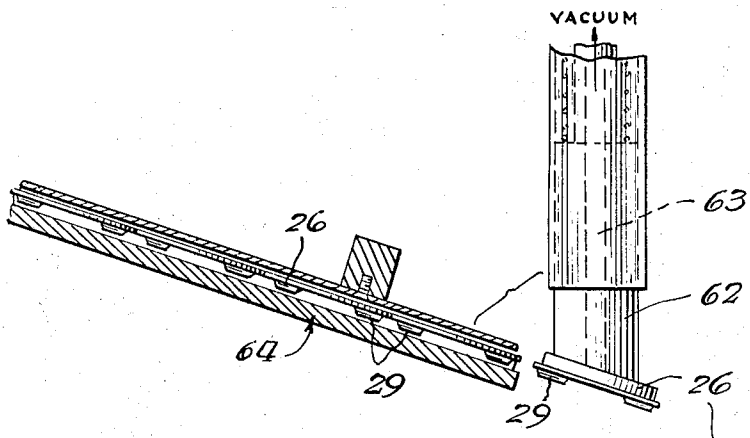


Fig. 7

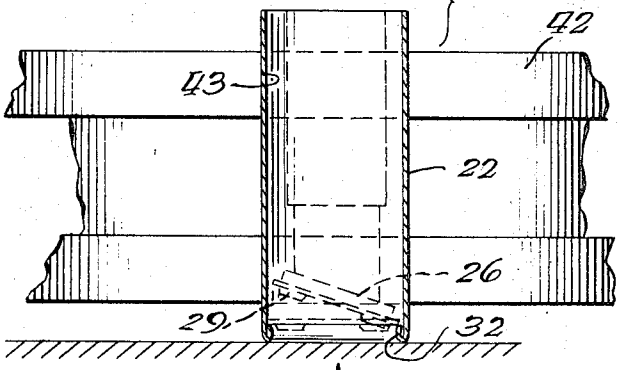
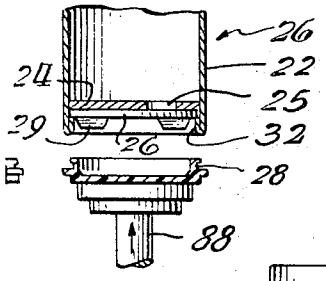


Fig. 9



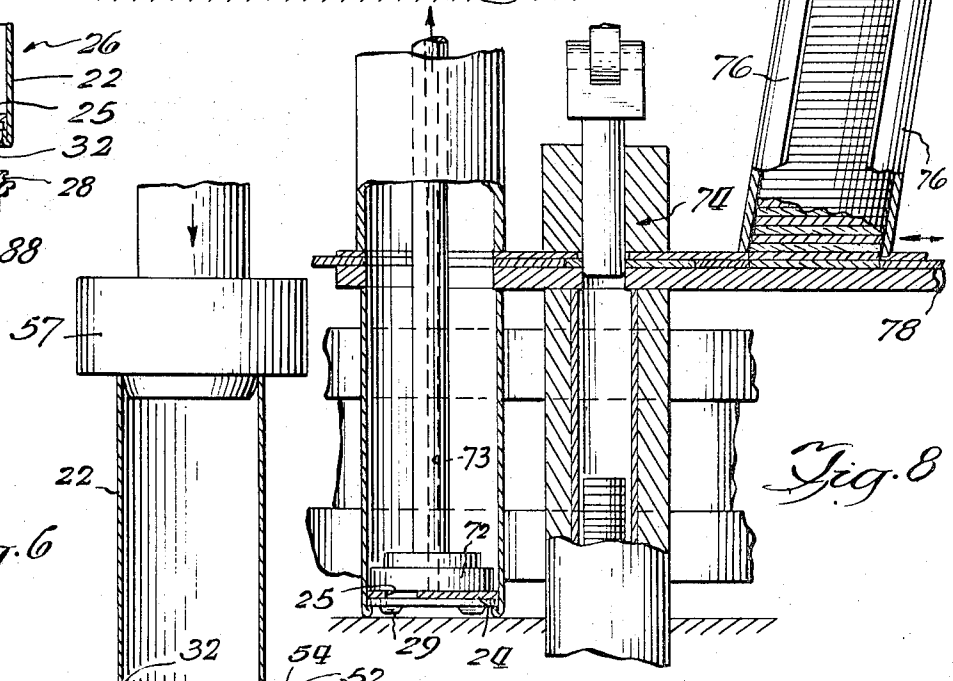


Fig. 8

Fig. 6

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MACHINE FOR ASSEMBLING SIFTER TOP PACKAGES

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Fig. 10

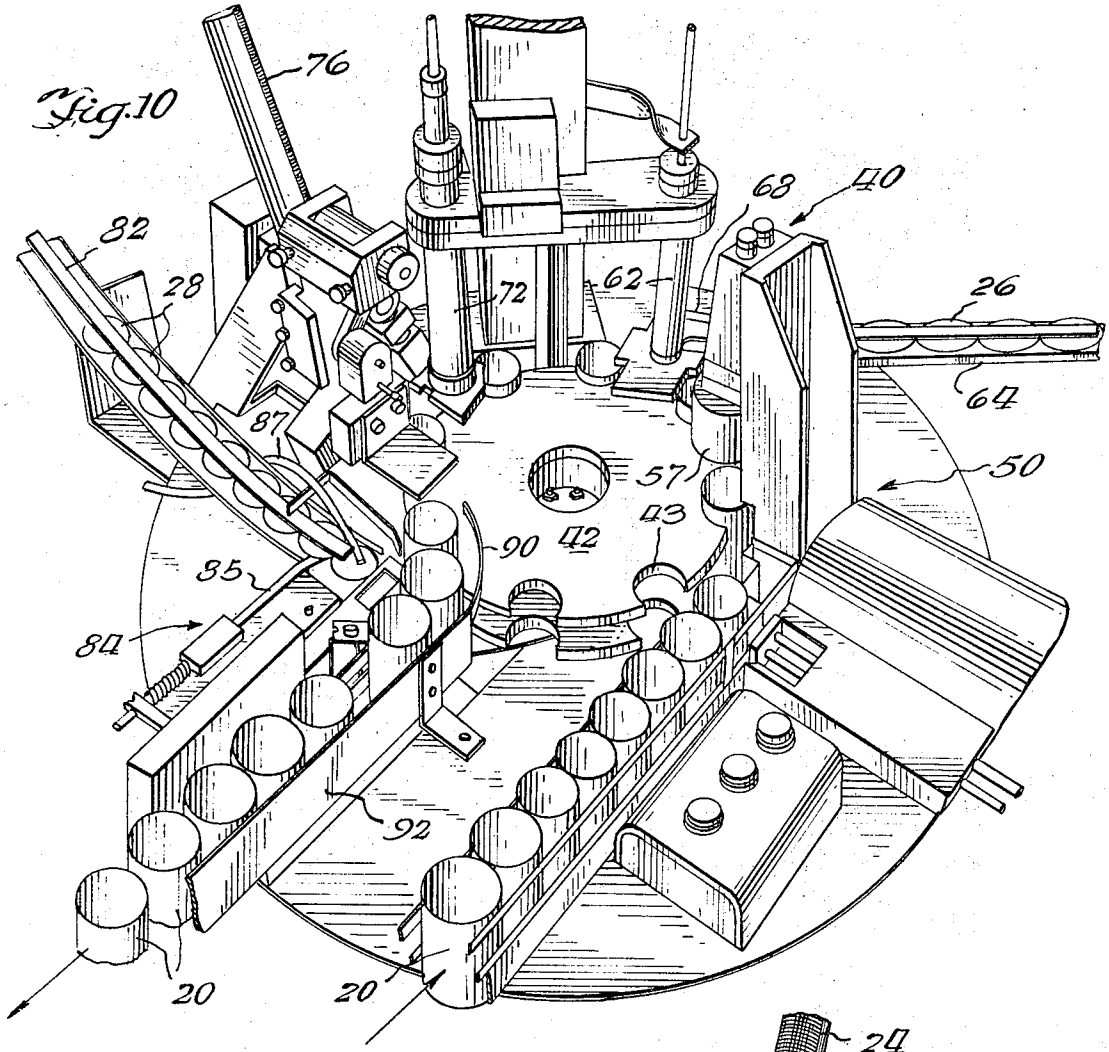
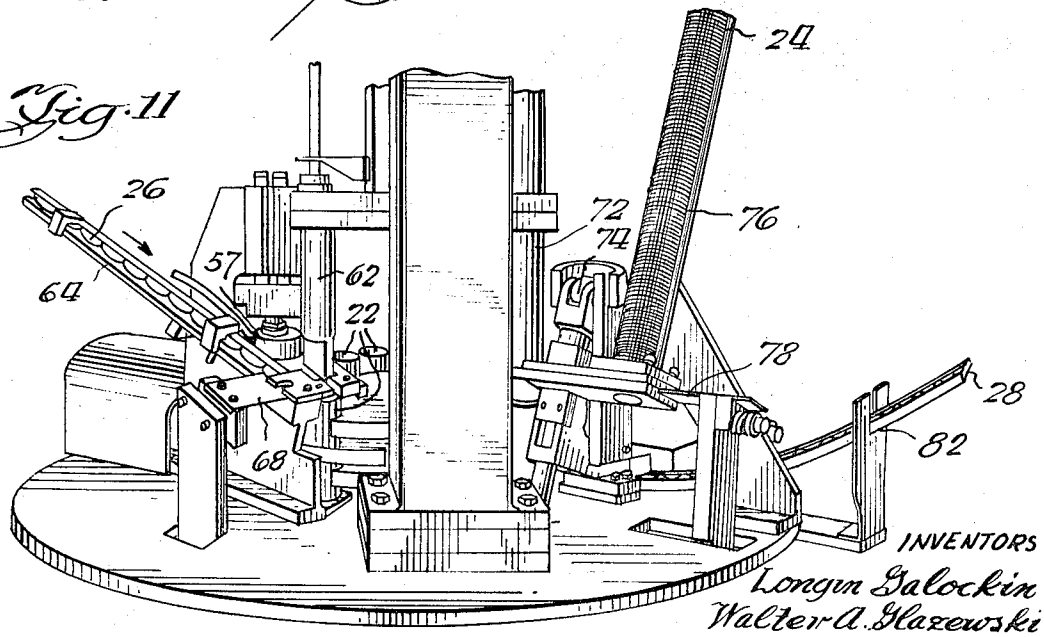


Fig. 11



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United States Patent Office

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MACHINE FOR ASSEMBLING SIFTER TOP PACKAGES

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Int. Cl. B23p *19/04;* B23q *7/10*
U.S. Cl. 29—208 17 Claims

ABSTRACT OF THE DISCLOSURE

A machine for assembling a partially completer sifter container or dredger for granular material prior to the filling thereof. The particular type of dredger comprises an elongate tubular body having a return-bent interior flange at one end thereof, an apertured cover member fixedly secured within said body element and a perforated sifter top rotatably engaged within said tubular body between the cover member and said interior flange, and an opposite open end for filling the partially completed container. The machine employs a plurality of work stations which perform the following assembly steps: curling of the open end of the body element inwardly to provide the interior flange; insertion of the sifter top within the body element in engagement with said flange; and insertion of the apertured cover member in frictional engagement with the interior walls of said body element to rotatably mount said sifter top between the flange and said cover member. These steps are performed with the sifter top and cover member each oriented in a predetermined position such that upon assembly the aperture in the cover member overlies or is in registry with an imperforated portion of the sifter top whereby subsequent filling of said dredger may be performed without the danger of granular material being discharged inadvertently through openings in the superposed sifter top and cover member. The machine is constructed to permit its stations to operate concurrently so that a tubular body is delivered to the first station, and other tubular bodies are in some stage of partial assembly and in completed partial assembly and being withdrawn from the machine during each cycle of operation of the machine.

BACKGROUND OF THE INVENTION

The invention relates to automatic apparatus for assembling dredger or sifter-type dispensing containers for granular material or the like and more particularly, to an improved machine for assembling a plurality of partially completed containers sequentially which subsequently may be filled and sealed by the users of said containers.

The sifter-type containers with which the machine embodying the invention is operable generally includes an elongate tubular body element having a sealed bottom and an apertured upper cover member with a sifter top rotatably affixed in superposed relationship to said cover. The tubular body has a return bent interior flange contiguous the upper end of the body which functions in conjunction with the apertured cover member to rotatably mount the sifter top.

The normal practice in the art is for the manufacturer of the sifter top containers to supply these to the producer or filler of the granular material in a partially completed condition, i.e., without the bottom closure member in place. Thus, this bottom end is open in the partially assembled condition of the container. The filler inverts the containers for filling through the open bottom end and then seals each container by affixing the bottom closure member thereto. Thus, it is absolutely essential that misalignment of the apertures or openings in the sifter top and the cover member be maintained during the filling operation; otherwise, the granular material will be discharged inadvertently, during filling from the container. In order to ensure the proper alignment of the sifter top and cover members, it was the prior art practice to assemble these dredges or sifter containers individually in manual steps. This manual method of assembly greatly increased the cost of production with attendant problems of manual opeartions and personnel problems.

SUMMARY OF THE INVENTION

The present invention solves the problems alluded to above by providing a machine which will automatically assemble a partially completed dredger in preparation for the filling operation, while ensuring the proper alignment or orientation of the sifter top and cover member to preclude seepage of the granular material during filling. The machine utilizes a plurality of work stations, at least two of which are employed to insert the perforated sifter top and apertured cover member. The sifter top inserting station employs means which orient the perforated portions of each sifter top such that upon insertion they are disposed in a predetermined spatial relationship with respect to the body element of the partially completed dredger. The cover member inserting station, which receives the dredgers from the sifter top inserting station, also employs means which disposes the cover members within the body elements with the apertures in a predetermined position, whereby said apertures will overlie imperforated portions of the previously oriented sifter tops and the several openings in these parts will be out of registry so that granular materials cannot be discharged inadvertently.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a completed sifter top container with a dust cover affixed to the upper end thereof.

FIG. 2 is an exploded perspective view of a partially completed container illustrated in an inverted position preparatory for filling.

FIGS. 3*a* to 3*e* are sectional views illustrating the progressive steps performed by the machine embodying the invention in the mass-production of the partially completed container of FIG. 2.

FIG. 4 is a schematic top plan view of a machine embodying the invention.

FIG. 5 is a sectional view taken along the line 5—5 of FIG. 4.

FIG. 6 is a schematic representation, partially in section, of the curling station of the machine of FIG. 4, illustrating how the interior return-bent flange is formed on the upper end of the tubular body.

FIG. 7 is a schematic representation of the sifter top insertion station illustrating the manner in which the sifter top is engaged by a plunger and positioned within the tubular body.

FIG. 8 is a schematic representation of the cover member inserting station illustrating how a cover member is sequentially punched and frictionally engaged within the tubular body.

FIG. 9 is a schematic representation of the dust cover inserting station.

FIG. 10 is a perspective view of an actual machine embodying the invention illustrated schematically in FIGS. 4 through 9.

FIG. 11 is a perspective view of the rear of the machine illustrated in FIG. 10, and more clearly illustrating the gravity feed arrangements for the sifter top, cover member, and dust cover inserting stations.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, there is illustrated, respectively, a completed and a partially completed sifter top container with which the invention is concerned. For the purposes of convenience and clarity, the container illustrated here, irrespective of degree of completeness, will be designated generally **20**.

The particular type of container **20** is comprised essentially of an elongate tubular body element **22**, an upper cover member **24** having an aperture **25** formed therein, a sifter top **26** provided with dispensing perforations **27** and a pair of finger grips or protuberances **29** to facilitate turning thereof, an optional dust cover **28**, and the lower or bottom closure **30**. The closure member **30** is shown in FIG. 1, but is omitted from FIG. 2 since the latter is illustrative of the container formation as supplied to a filler with the closure member being supplied separately for subsequent assembly to the body **22** after filling.

While the machine embodying the invention is designed primarily to provide a partially completed container for subsequent filling, it must be understood that the invention is not limited thereto. It is contemplated that the machine of the invention may be modified to add a filling station and a sealing station for affixing the lower closure member **30** to the body element **22** either as a part thereof or is set up therewith as part of a line.

The sequential steps for forming the partially completed dredger of FIG. 2 are illustrated in FIGS. 3*a* through 3*e*. First, the uncurled tubular body **22** is subjected to a curling operation which return-bends an end thereof inwardly to define an interior curl or reverse-bent flange **32** illustrated in FIG. 3*b*. Next, the sifter top **26** is inserted into the curled body **22** in engagement with the flange **32**, and thereafter, the apertured cardboard or plastic or metal disk or upper cover member **24** is inserted into the body **22** in position overlying and engaged upon the sifter top **26** as shown in FIGS. 3*c* and 3*d*. The engagement of the upper cover member **24** within the body **22** is of a frictional nature such that the sifter top **26** is rotatably mounted between the flange **32** and said cover member **24**. The last step of the assembly is illustrated in FIG. 3*e*, and involves affixing the dust cover **28** within the well or space defined by the reverse-bent flange **32** and the sifter top **26**. The dust cover **28**, as well as the specific construction thereof, are optional features and may vary depending upon the specific requirements and desires of the filler.

Attention is directed to the circumstance that in the partially completed dredger **20** of FIG. 3*e*, aperture **25** in cover member **24** is in registry with or overlies on

imperforated portion of the sifter top **26**. If this relationship is not achieved and the respective openings **25** and **27** are aligned or in registry to any degree, upon filling, the granular material will escape and fill the dust cover **28**.

Turning now to FIGS. 4 through 11, there is illustrated the automatic machine of the invention which will perform the sequential assembly steps illustrated in FIGS. 3*a* to 3*e* while ensuring the proper orientation of both the sifter top **26** and the cover member **24** so as to obviate any problems of leakage during the aforementioned filling operation.

FIG. 4 is a schematic representation of the machine of the invention, which will be designated generally **40**. Machine **40** employs a plurality of work stations, the general construction and operation of which are illustrated in and will be described in connection with FIGS. 6 through 9. Machine **40** is provided with a turret and conveyor or transport arrangement **42**, said turret having a plurality of stations or recesses **43** formed therein designed to receive and hold a body element **22** in various stages of assembly. In operation of the machine, there is employed a conventional drive arrangement (not shown) which uses a Geneva gear system driven from fractional horse-power motors through linkages for indexing movement of the turret **42**. With this particular drive arrangement and gear system, the work at the various stations will be performed simultaneously, each indexing of the turret **42** discharging a completed item.

To supply the uncurled body elements **22** to the machine an infeed conveyor **44** and a pusher **46** are used. Accordingly, as the turret **42** indexes, pusher **46** will dispose an uncurled body element **22** in upright position in one of the recesses **43** in said turret **42**. It should be noted that the uncurled body element **22** is supplied to machine **40** in an inverted position, as illustrated in FIG. 2.

Continued indexing of the turret **42** will dispose the uncurled body element **22** approximate the curling station, which is designated generally as **50**. At curling station **50**, the upper edge of the body element **22** which is facing downwardly due to the inverted position of said element **22**, is curled inwardly to form the reverse-bent flange or bead **32** shown in FIG. 3*b*.

The general construction of curling station **50** is illustrated schematically in FIG. 6 and includes, a reciprocal curling die **52** having an annular forming groove **54** and a heating coil **56**. When the uncurled body element **22** is positioned approximate the curling station **50**, one edge thereof will align with the groove **54**, while the other edge is positioned to be engaged by plunger **57**. Accordingly, the plunger **57** will engage the body element **22** forcing same downwardly, while the die **52** is moved upwardly by way of the pusher **58** to engage the body element. This joint movement of the plunger **57** and the die **52** exerts proper pressure on the body element **22** in conjunction with the heating effect achieved by coil **56** so as to curl the end thereof inwardly to form the flange or bead **32**.

After flange **32** is formed, both the plunger **57** and the curling die **52** retract to permit the curled body element **22** to be indexed to the next work station, which is the sifter top inserting station. The sifter top inserting station is designated generally **60** in FIG. 4, and the general construction thereof is illustrated in FIG. 7.

At the sifter top inserting station **60**, a sifter top **26** is disposed within the curled body element **22** in engagement with flange **32** by a piston **62**, as shown in FIG. 3*c*. Associated with the piston **62** is a vacuum line **63** which is connected to a source of vacuum (not shown) so that as the sifter top is positioned beneath said piston **62**, the vacuum pressure will hold said top **26** in engagement with the piston **62**, thus permitting proper seating of said top on the flange **32**, as illustrated in phantom in FIG. 7.

The apparatus for supplying the sifter tops **26** to the inserting station **60** is illustrated schematically in FIG. 4 and can be viewed more readily in FIGS. 10 and 11. As

was discussed previously, not only must the sifter top **26** be properly seated within the body element **22**, but it must be inserted such that the perforated portions **27** are in a particular orientation with respect to said body element **22**. To achieve such proper orientation, the sifter tops **26** are supplied to station **60** by way of a chute **64** which is associated with a part feeding device (not shown) of the type designed to supply parts in the particular orientation. Parts feeders of the type mentioned are known in the art, and those such as produced by the Syntron Company of Homer City, Pa. are well suited for use with the present invention, it thus being deemed unnecessary to elaborate on the particular construction thereof.

Chute **64**, as illustrated in FIG. 5, is comprised of an upper guide member **65** and a lower guide track **66**. The lower guide track **66** is provided with an elongate channel **67** in which the protuberances **29** of the sifter tops **26** are disposed. Thus, as the sifter tops **26** move under the influence of gravity down the chute **64** along track **66**, the orientation of the perforated portion **27** of each top will be the same and preferably that as illustrated in FIG. 4.

Positioned at the lowermost point of chute **64** is a reciprocal pusher **68**. The pusher **68** is operated to index an individual sifter top **26** into position for engagement by the piston **62** which will then dispose said top within the body element as described above. With the particular apparatus illustrated and described, the perforated portions **27** of the sifter tops **26** will always be disposed in the same relationship with respect to body element **22**, i.e., they will lie along the line **69—69**.

Once the sifter top **26** is properly inserted within the body elements **22**, the turret **42** will index thereby transferring the dredger **20** to the cover member inserting station which is designated generally **70**. The particular turret arrangement illustrated is an eight position unit, and accordingly, with the respective stations positioned in the manner illustrated it will take two indexing movements of the turret before the dredger **20** reaches the cover member inserting station **70**. Also, it should be noted that as the turret indexes and transfers the dredger **20** from station to station, the position of a body element with respect to the turret **42** does not change so that the line **69—69** which represents the orientation of the perforations **27** will always form the same angle α with a radial line **71—71**.

The cover member inserting station **70**, which is illustrated in detail in FIG. 8 employs inserting means similar to that used by the sifter top inserting station **60** in that a piston **72** having a vacuum line **73** is employed to dispose the cover members **25** within the body elements **22**. In actual practice, the respective pistons **62** and **72** are ganged and the vacuum lines **63** and **73** are connected to the same source of vacuum. The vacuum line **73** maintains the cover members **24** in engagement with the piston **72** during insertion, which is extremely important since the cover member **24** is slightly oversized so that it may be frictionally engaged with the inner walls of the body **22** to wedge same in place overlying the sifter top member **26**.

As was discussed previously, it is essential that the cover members **24** be inserted with their aperatures **25** in a predetremined position, namely, having their centers on a diametrical line disposed substantially at 90 degrees with respect to the line **69—69**. If such is the case, then proper orientation is ensured and the aperatures **25** will overlie imperforated portions of the sifter tops **26**.

To ensure the proper orientation of the cover member **24** when same is supplied to the piston **72**, there is associated with the piston **72** a punch or a cutter **74** which forms the aperatures **25** in the cover member. The blank or imperforate cover mombers **24** are fed to the cutter **74** from a hopper **76** by means of a pusher **78** which is also used to force the punched or apertured cover member **24** into position for engagement by the piston **72**. While this feed arrangement is illustrated schematically in FIG. 4 it actual construction in a working embodiment of the invention can be seen in FIG. 11.

Accordingly, by use of the punch or cutter **74** to form aperture **25** immediately prior to disposition thereof within the body element **22**, it is ensured that the aperture **25** of each cover member supplied to piston **72** will be in the same position or orientation. Taking into account the previously discussed orientation of the perforation **27** along the line **69—69**, by selecting the location for the punching of the apertures **25** it can be assured that said apertures will be properly aligned upon final assembly of the cover member **24** within the body element **22**.

After the sifter top **26** and the cover member **24** have been assembled within body element **22**, dredger **20** is then ready for filling and may be discharged from the machine. With the embodiment shown in the drawings, however, there is provided a further work station for the affixing of the dust cover **28**, said cover affixing station being designated generally **80**.

The dust covers **28** are supplied to the affixing station **80** by means of a gravity chute **82** in much the same manner as previously discussed with regard to the sifter tops **26**. However, unlike the sifter tops **26**, there is no need for the dust covers to be supplied in any specific orientation. Dust covers **28** are supplied individually to a point immediately below the dredger **20**, as same arrives at the affixing station **80**. This is achieved by means of a separator mechanism **84** which is coupled to the overall gearing system of the machine. The separator mechanism **84** utilizes a spring-biased arm **85** and a pusher **86** which are ganged for alternate operation. Thus, as the arm **85** is retracted to permit one of the dust covers **28** to move down the chute **82**, the pusher **78** is advanced to engage the said dust cover and move same into a position immediately below the dredger **20**. The movement of the dust covers **28** along chute **82** may be facilitated by the use of an air-jet supplied by the conduit **87**.

Referring now to FIG. 9, the means for affixing the dust covers **28** to the dredger **20** is illustrated. At the dust cover affixing station **80**, there is provided a piston or plunger **88** having an upper planar surface **89** which receives the dust covers **28** from the pusher **86**. Once received in the position illustrated and with the dredger **20** positioned approximate affixing station **80**, the dust cover **28** will align with the well defined by interior flange **32** and the sifter top **24** of said dredger whereby upon operation of the piston **88** said cover may be fixed thereto.

Upon indexing of the turret **42** after the dust cover **28** has been affixed, dredger **20** will be engaged by a spring arm **90** which is effective to remove the partially completed dredger from the recess **43** in turret **42**. As the dredgers **20** are removed from the turret **42**, they will be received by a discharge conveyor **92** for transportaiton from the machine **40**.

In FIGS. 10 and 11, which have been alluded to previously in conjunction with the description of the schematic illustrations of FIGS. 4 and 9, there is shown an actual embodiment of a present invention with the various elements thereof bearing the same reference character as the corresponding parts of the previously discussed schematic representation. The machine or embodiment of FIGS. 10 and 11 is designed to perform the sequence of operations illustrated in FIGS. 3*a* through 3*e*. In addition, the apparatus at the various stations is adjustable so that dredges of various sizes may be accommodated. In addition, the machine **40** employs an eight position arrangement, with room for additional stations, it being intended that said machine may be adapted for other operations such as the filling and sealing of said dredgers.

While the invention has been described in conjunction with the accompanying drawings, it is envisioned that means equivalent to those described and illustrated may be employed to perform the sequential steps described

above without departing from the spirit and scope of the invention. In addition, it is also envisioned that one or more of the discussed stations or operations may be omitted, for example, the body elements may be precurled prior to being supplied to said machine, thus eliminating the need for the curling station; or the dust cover affixing station may be omitted depending entirely upon the user's requirements.

What it is desired to be secured by Letters Patent of the United States is:

1. A machine for automatically and sequentially assembling a plurality of like dispensing containers into a partially complete condition for thereafter being filled with granular material or the like, each container comprising an elongate tubular body having a return-bent interior flange at one end thereof, an apertured cover member secured within said body portion, and a perforated sifter top rotatively engaged within said body element between the cover member and said interior flange, and an opposite open end, said machine comprising: a curling station means for providing the interior flange on the said one end of a tubular body; a sifter top station including means for inserting the sifter top within a said tubular body in engagement with said interior flange, said sifter top station means including orienting means for positively positioning said sifter top with its perforations in a predetermined spatial relationship relative to the tubular body; and a cover inserting section including means for engaging an apertured cover member within a tubular body in superposed relationship with respect to said sifter top and with the aperture therein in registry with an imperforate portion of said sifter top, whereby a partially completed container may be filled through said open end without the granular material being discharged through any of the openings in the superposed sifter top and cover member respectively of a container while being filled.

2. A machine as defined in claim 1 and further including a dust cover station having means for affixing a dust cover to overlie said one end of a tubular body with its assembled cover member and sifter top.

3. A machine as defined in claim 1 wherein said sifter top inserting means includes a piston which engages and seats said sifter top within the tubular body in engagement with said interior flange.

4. A machine as defined in claim 3 wherein said piston includes vacuum means for maintaining the engagement between the piston and the sifter top during the inserting step.

5. A machine as defined in claim 1 wherein said orienting means includes a track over which said sifter tops travel, said track having an elongate groove extending along its length for receiving protuberances formed on said sifter tops at preselected locations, whereby to positively position the perforated portions of each sifter top similarly oriented with respect to each tubular body in which the same is inserted by said sifter top inserting means.

6. A machine as defined in claim 1 wherein said cover inserting means includes a piston operable to force the cover member into the tubular body with the marginal edges of the apertured cover member in frictional contact with the interior walls of the tubular body.

7. A machine as defined in claim 6 wherein said piston includes vacuum means to maintain engagement between the piston and the cover member during disposition of said cover member in said tubular body.

8. A machine as defined in claim 1 and in combination, further including cutter appaartus associated with said apertured cover member inserting means, said cutter apparatus operable to form the aperture in said cover member immediately prior to insertion thereof into said tubular body and at a predetermined location whereby said cover member will be so positioned with respect to the previously oriented sifter top that said aperture therein overlies an imperforate portion of said sifter top.

9. A machine as defined in claim 1 wherein said curling station means includes a die having an annular forming groove, and a plunger for forcing said one end of the tubular body into said groove to curl said end inwardly thereby defining said interior flange.

10. A machine as defined in claim 9 and including a heating means associated with said die to facilitate the curling operation.

11. A machine as define in claim 1 including conveyor means for delivering tubular bodies to the stations of the machine and for removing the partially completed containers.

12. A machine as defined in claim 1 in which each station is operated concurrently in a mass-production type operation.

13. A machine as defined in claim 1 in which said sifter top inserting means and aperture cover inserting means are ganged for concurrent operation.

14. A machine for automatically assembling a partially completed dredger for granular material or the like, said dredger including an elongate tubular body element having an interior flange on one end thereof, a cover member having an aperture formed therein and being frictionally disposed within said body element, and a perforate sifter top disposed in engagement with said flange and interposed between said apertured cover member and said flange, whereby said sifter top may be rotated to align the perforated portions thereof with said aperture to permit dispensing of the granular material, said machine comprising: means for inserting a sifter top within a body element having an interior flange formed on one end thereof, said means including apparatus to align and orient said sifter top such that the perforated portions thereof are in a predetermined position with respect to said body element upon insertion of said sifter top therein, and additional inserting means for disposing the aperture cover member within the body element and in engagement with the sifter top, said additional inserting means orienting the apertured cover member with respect to the body portion such that the aperture formed therein overlies an imperforated portion of said sifter top, whereby said dredger may be filled subsequently without danger of the granular material escaping through aligned openings in the superposed sifter top and cover member.

15. A machine for automatically assembling a partially completed dredger for granular material or the like, said dredger including an elongate tubular body element having an interior flange on one end thereof, a cover member having an aperture formed therein and being frictionally disposed within said body element, and a perforate sifter top disposed in engagement with said flange and interposed between said apertured cover member and said flange, whereby said sifter top may be rotated to align the perforated portions thereof with said aperture to permit dispensing of the granular material, said machine comprising: means for providing an interior flange on one end of the body member, means for inserting the perforated sifter top within said body member in engagement with said interior flange such that the perforated portions thereof are oriented in a predetermined relationship with respect to the body element, and means for inserting the apertured cover member frictionally within the body portion in engagement with the sifter top and in a predetermined orientation with respect to said body element, such that said aperture formed therein overlies an imperforated portion of the sifter top.

16. The machine as defined in claim 15 further including conveyor apparatus for transmitting the partially assembled container from one of said means to the other.

17. A machine for partially assembling a dredger prior to the filling thereof with a granular material, said dredger comprising an elongate tubular body element having a reverse-bent interior flange formed on one end thereof,

a cover member frictionally disposed in said body element and having a dispensing aperture formed therein, and a perforated, relatively rotatable sifter top disposed between said flange and said apertured cover member, said machine comprising: a curling station including a die for forming the reverse-bent flange on one end of the embodied element, a sifter top inserting station including means for disposing a sifter top within the body element in engagement with the reverse-bent flange, said means including apparatus for orienting said top such that the perforated portions thereof are disposed in a predetermined relationship with respect to the body element, a cover member inserting station including means for frictionally engaging a cover member within the body element in a contiguous predetermined relationship with respect to said sifter top such that the apertures formed

in said cover member overlies an imperforated portion of the sifter top, and a dust cover affixing station including means for assembling a dust cover on said embodied element to overlie and block said one end thereof, and a conveyor means for transporting the partially completed dredgers from one station to the other, said conveyor means including infeed and discharge apparatus.

References Cited

UNITED STATES PATENTS

3,374,605 3/1968 Satchwell et al.

THOMAS H. EAGER, Primary Examiner

U.S. Cl. X.R.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,538,583 Dated November 10, 1970

Inventor(s) Longin Galockin, Walter A. Glazewski, Eugene R. Sitkowski

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 14, before "sifter" change "completer" to --completed--;
Column 5, line 49, before "within" change "25" to --24--;
Column 5, line 71, after "cover" change "mombers" to --members--;
Column 6, line 1, before "actual" change "it" to --its--;
Column 6, lines 54 and 55, after "for" change "transportaiton" to --trans-portation--;
Column 7, claim 1, line 28, after "inserting" change "section" to --station--;
Column 7, claim 8, line 70, after "cutter" change "appaartus" to --apparatus--;
Column 8, claim 11, line 11, after "as" change "define" to --defined--;
Column 9, line 16, delete "s" after "apertures".

SIGNED AND
SEALED
[illegible] 1971

Febuary 9,1971

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents