MACHINE AND METHOD FOR MAKING SEALING CLOSURES

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75 Fig. 10 76 77 Fig. 11

Fig.9

84 82 : 83

Fig.12 86 85 87 88

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MACHINE AND METHOD FOR MAKING SEALING CLOSURES

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27 Claims. (Cl. 18-5)

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This invention relates to the manufacture of closures for containers, as for instance closures for bottles, jars, etc.

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In my copending application, Serial No. 574,555, filed January 25, 1945, I have disclosed methods and means for forming and adhering to the undersides of caps or lids a gasket member comprising a ring portion for engaging the top edge of the jar or bottle, and a membrane-like portion spanning the hole of the ring portion to 10 isolate the contents of the jar or bottle from the cap or lid, which latter is usually made of metal. or other non-yielding material. In said application, the gasket member is blanked from a strip of gasket material issuing from a warming 15 mill, and concurrently molded directly onto the cover or lid.

Reference is also made to my co-pending application Serial No. 590,459, filed April 26, 1945, disclosing specific and related methods and means 20 for forming and applying gasket members to the undersides of caps or lids and to my co-pending application Serial No. 642,193, filed January 19, 1946, which comprises a continuation-inpart of this application and the above-identified 25 application and wherein may be found generic claims covering subject matter common to these applications.

The present application discloses another species of my invention, for obtaining the same re- 30 sult, and in this species the gasket member is also blanked from a continuous strip of uncured gasket material, but instead of being molded on the cap or lid at the blanking station, after the blanking of the member, it is deposited in the 35 lined caps to be achieved, at economical cost. cap or lid, and transported with the latter from the blanking station to another station in which it is molded or formed and bonded to the cap.

During the transporting of the blank, heat is applied to give it the desired degree of plasticity, 40 while simultaneously the closure is heated, so that the forming and molding process causes the blank to securely adhere to the closure.

This sequence of operations is carried out, in the specific embodiment of the invention dis- 45 closed herein, through the use of a machine having a support which moves step-by-step, such as a dial which receives closures from a supply source, presents the closures to the station where the blanks are deposited, and carries the clo- 50 sures and blanks to a forming or molding station, after which the lined closures are discharged into a waiting receptacle.

As used herein, the term "dial" indicates a rotary table for supporting on the surface there- 55 2

of a plurality of closures to receive blanks and to be advanced serially by rotation of said table during a sequence of operations.

The species of my invention herein disclosed is especially advantageous where closures or other members having deepskirts or flanges are to receive the gasket material. The shapes of such articles interfere with the applying of a liner by a rolling action, such as results from dies being carried on wheel peripheries, and being made to approach, and separate from each other by moving along curvilinear paths, but does not interfere with a rectilinear approach of the molding die, and the applying of liners to deep caps by such approach may be accomplished in the form of the invention herein disclosed.

This species of the invention is also advantageous in connection with shallow caps or lids, the flanges of which are fluted or otherwise unsuited for use as a blanking means to sever blanks from the strip of gasket stock, since the blanking may be done independently of the flanges by a punch-die couple operated by power means to automatically blank the strip stock and deposit the blanks in the caps on the dial.

The improvements for making and applying gaskets to container closures which are common to the inventions disclosed herein and in my copending application Serial No. 574,555, filed January 25, 1945, are claimed in the latter application along with specific improvements disclosed therein.

The methods and apparatus of the present application enable extremely high production of

Not only are savings effected in the cost of fabrication of lined caps and lids, but a more effective and satisfactory sealing closure is obtained, which reduces spoilage, deterioration, etc., of the contents of containers employing the same.

Such closures, for instance, as disclosed in my copending applications, Serial Numbers 95,643, 570,538, and 570,539, now Patent No. 2,492,144, may be advantageously, economically produced.

According to the method of the present embodiment of my invention, a quantity of gasket material is worked in a warming mill and a ribbon stripped therefrom is passed, with an intermittent movement, between blanking dies mounted over the dial of a machine. Blanks are cut from the strip and may be deposited immediately in caps or lids, which at a prior point have been fed to the dial, and as the latter is intermittently advanced the caps and blanks are transported

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and heated, until a forming or molding station is reached. At this point a punch operates to form and mold the blanks to the caps to form complete assemblies, after which, as the dial turns further, the assemblies are ejected from the dial and deposited in a suitable receptacle.

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In common with the provisions of my copending application Serial Number 574,555, the liners in the closures are cured by passing through a curing chamber after they are molded, and the 10part of the ribbon of uncured rubber-like material from which the blanks were taken is returned to the warming mill for further use.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a top view showing in schematic outline the machine for lining caps according to the invention.

Fig. 2 is an elevation of the machine, looking 20 in the direction of the arrow of Fig. 1.

Fig. 3 is a diametric section of a lid, carrying a blank or rubber-like gasket material, prior to the molding of the blank.

Fig. 4 is a diametric section of the lid of Fig. 3, 25 with the blank molded and bonded to its entire inner surface.

Fig. 5 is a diametric section of another type of lid, carrying a blank of gasket material, prior to the molding of the blank. 30

Fig. 6 is a diametric section of the lid of Fig. 5 but with the blank molded to it to form a lining or diaphragm and an integral sealing ring, all bonded to the inner surfaces of the lid.

Fig. 7 is a diametric section of a lid structure 35 similar to that of Figs. 5 and 6, but carrying a ring-shaped blank of gasket material, resting on the inner shoulder of the flange.

Fig. 8 is a diametric section of the lid of Fig. 7 but with the ring-like blank molded and bonded 40 to it, to form a sealing ring and an integral cylindrical lining in the lid.

Fig. 9 is a diametric section of a bottle cap carrying a blank of gasket material.

Fig. 10 is a diametric section of the bottle cap 45of Fig. 9, the gasket blank having been molded to form a sealing ring and integral diaphragm, bonded to the inner circular face of the cap.

Fig. 11 is a diametric section of a deep bottle cap having a sealing ring and integral lining $_{50}$ bonded to its entire inner surface, and

Fig. 12 is a diametric section of a similar bottle cap having a sealing ring and diaphragm bonded to the inner circular face of the cap.

Referring to Figs 1 and 2, the apparatus of the 55present invention comprises a machine frame 20 having a substantially horizontal bed 21 on which there is rotatably mounted a circular dial 22.

The frame 20 carries a warming mill 23 located above the rear portion of the dial 22, the said $_{60}$ may be ejected from the dial and passed out mill comprising cylinders 24 and 25 rotatably mounted on spindles 26 so that their peripheries extend closely adjacent each other as shown.

The cylinders 24 and 25 are so arranged that gasket material 27 which is being worked thereby 65 will adhere to the surface 25a of the cylinder 25 in a layer of desired thickness so that a ribbon 29 may be cut and stripped from said surface by a stripper 28 as shown in Fig. 2. The strip 29 of gasket material thus provided is fed around a 70 take-up roller 30 and between feed control rollers 31 and 32 carried by the machine frame 20.

After leaving the feed rollers 31 and 32, the ribbon or strip 29 of gasket material is brought over a table or plate 33 and between feed con- 75 22, and during the periods of rest of the strip and

trol rollers 34 and 35. The strip 29 is thence brought upwardly around a take-up roller 36 and between feed rollers 37 and 38, and then fed back into the warming mill to commingle with the quantity of material 27.

As shown in Fig. 1, the dial 22 is provided along its periphery with a plurality of holders or nests 39 adapted to receive and carry cup-like members 40, which may be of the type commonly used for jars or bottle closures as shown in Figs. 3 through 12, and any suitable magazine feed means well known in the art may be provided for automatically depositing the members 40 in the nests 39 of the dial 22.

According to the present invention means are provided for supplying, and for depositing in the cup-like members or lids 40, measured quantities of the uncured rubber-like gasket material 27. In the embodiment of the invention shown herein this means includes the continuous strip 29 of gasket material, and also includes a blanking die 41 mounted on the machine frame 20, and a reciprocable blanking punch 42 mounted on a vertical post 43 carried by the frame 20.

The die 41 and punch 42 are so arranged that the strip 29 of gasket material passes between them, and when the punch is made to descend into the die a blank 44 of gasket material is cut out, and is deposited in one of the lids 40 carried by the dial.

Thus, as the dial 22 is rotated step-by-step in the direction shown by the arrow of Fig. 1, the lids or cups 40 may be deposited in successive nests 39, and by operation of the punch 42 in coordination with the dial the lids 40 may have the blanks 44 respectively deposited in or on them.

Referring to Fig. 2, the dial 22 may have steam lines or channels 45, indicated by the dotted lines, provided in it for the purpose of heating the lids 40.

As the dial 22 is made to continue its intermittent turning movement, the lids 40 and blanks 44 will be brought to a molding station 46, at which a molding die 47 is provided, reciprocably mounted in an overhanging arm 48 forming part of the frame 20 of the apparatus.

As each lid 40 and its blank 44 is brought under the molding die 47 the latter is made to descend and engage the blank 44 under pressure so as to press and mold or shape the latter against the inner surfaces of the lid. Because of the heat imparted to the lids, the blanks 44 will have been softened or maintained sufficiently plastic during their travel with the dial 22, and when the blanks are pressed and molded, the lids 40 being hotter than the die, the blanks will adhere and be bonded to the lids. When the molding die 47 is raised, the dial 22 may be again advanced, and the lids 40 with the molded linings through a chute 49 from which they may be taken to a curing chamber by a suitable conveyor or other means not shown.

For the purpose of ejecting the lids, referring to Fig. 2, the nests 39 of the dial are provided with plungers 50 the lower ends of which engage a stationary cam 51 at the discharge station adjacent the chute 49. The cam 51 raises each of the plungers successively during the movemens of the dial, and thereby raises the lids 40 from the nests 39 so that a sweep arm 52, Fig. 1, sweeps the coated lids from the dial.

Preferably, the strip 29 of gasket material is moved intermittently, concurrently with the dial 5

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dial the blanking punch 42 may descend to cut out a blank 44. During the period of rest of the strip 29, the cylinders 24 and 25 of the warming mill may continue to rotate, since the take-up rollers 30 and 36 will automatically adjust for slack or shortening of the strip, as indicated in Fig. 2.

As shown in Figs. 3 through 12, various shapes of lids, caps or cup-like members may be provided with sealing rings or membranes by the apparatus of this invention.

Referring to Fig. 3, a lid structure 53 of the type commonly employed with jars, jelly glasses and the like is shown. The lid structure 53 has the usual dished circular center portion 54 on 15 which has been deposited a blank 55 of rubberlike gasket material, the blank being punched from the strip 29 by the punch and die 42 and 41. Upon the lid 53 and blank 55 reaching the molding station 46, the die 47 descends and 20 presses the blank 55 into the lining 56 shown in Fig. 4. Thickness of the various portions of the coating 56 is determined by the shape of the molding die 47, and also by the amount of gasket material contained in the blanks 44. This 25 amount of material may be closely predetermined and held by adjusting the clearance between the cylinders 24 and 25 of the mill 23 and by choosing the proper sizes of blanking die and punch 41 and 42 respectively.

The thickness of the blank 55 shown in Fig. 3 has been exaggerated an extent for the purpose of clarity of illustration. However, it should be understood that the thickness and diameter are such that the quantity of material is sufficient to enable the lining 56 to be formed and molded without waste. The diaphragm or membrane portion of the lining 56 may have a thickness of approximately .005", and the sealing ring portion may advantageously be .020" thick.

After linings 56 have been formed on lid structures 53, the structures may be heated to carry the linings by means of suitable conveying and heating devices, not shown.

Another common type of lid structure 59 is 45 shown in Fig. 5. A blank 60 of gasket material may be deposited in the structure 59, according to the invention, and the die 47 so shaped that, when it engages and molds the blank 60, a lining 61 is produced and bonded to the lid, as shown in Fig. 6. The lining 61 may have a thin diaphragm portion 62, a sealing ring 63 and a connecting skirt portion 64, the latter two being securely bonded to the inside surface of the shouldered flange 65 of the lid structure.

The lid structure 59 of Fig. 5 may be provided with a lining or coating 66 extending only along the inside surface of the peripheral flange 65, as shown in Fig. 8. To accomplish this, a blank 67 in the form of a ring is cut from the strip 29 of gasket material and deposited in the lid against the shoulder **68** thereof as shown in Fig. 7.

For producing the lining 66, the molding die 47 is so shaped that when in its lowermost position, it fully engages the inner circular face 69 of the lid. Clearance which is provided between the flange 65 of the lid and the side surfaces of the die 47 is thus occupied by the gasket material, which is made to flow and take the shape shown in Fig. 8. It will be seen that the lining 66 has a thin skirt portion 70 and a thicker ring portion 71, both of which are securely molded and bonded to the inside of the flange 65.

Closures such as crown caps for bottles and the like may also be advantageously provided

with liners, according to the method and apparatus of the invention. As shown in Fig. 9, a bottle closure or cap 74 has deposited therein a blank 75 of rubber gasket material, as punched from the sheet 29 by the punch 42. The molding die 47 is so shaped that when it engages the blank 75 it molds the latter to the shape shown in Fig. 10 comprising a thin membrane-like diaphragm 76 and a sealing ring 77 encircling the diaphragm and integral with the latter, the sealing ring having conventional thickness.

The method and apparatus of the present invention is particularly advantageous where it is desired to coat the inner surfaces of cup-like members having relatively deep cavities, as for instance closures employed with catchup bottles and the like, since the molding die 47 may have a considerable stroke so that it may enter and leave deep cavities without interfering with walls of the members.

As shown in Fig. 11, a closure 79 having a comparatively deep cavity 80 is provided over its entire inner surface with a coating 81 of rubberlike gasket material. The coating 81 may have a thin membranous portion 82 surrounded by and integral with a sealing ring 83 of conventional thickness, which ring is in turn connected with a thin portion **34** covering the entire side walls of the closure **19**. In producing the closure 30 79 the molding die 47 is shaped to fit the inside of the closure structure with clearance as indicated by the thickness of the various portions of the lining 81.

At the time that the die 47 is descending into 35 the cavity 80 of the closure 79, and after it initially engages the blank 44 of gasket material, it will force this material upwardly around the inside walls of the closures so as to completely cover the said walls, and due to the heat of the closure 40 the gasket material will adhere to the said walls, being securely bonded thereto.

If desired, a closure 85 having a deep cavity may be provided with a sealing coating 86 covering only the bottom part of the cavity, and

the coating 86 may have a thin membranous portion and also a thicker ring portion 38 as shown,

In this case the said walls of the molding die 47 would be made to closely fit against the inner side walls of the closure 85 when the punch is 50 in its lowermost position, and the amount of gasket material in the blanks would be just sufficient to form the coating as indicated.

Variations and modifications may be made within the scope of this invention and portions of 55 the improvements may be used without others. I claim:

1. In the process of producing sealing closures for containers, the steps of plasticizing a quantity of moldable gasket material and producing a con-60 tinuous strip of said material, depositing a succession of closures on movable supporting means for carrying the closures from a blank-receiving position to a gasket molding position, feeding said strip of gasket material past said supporting 65 means, cutting and completely severing unfinished gasket blanks from said strip adjacent said supporting means, depositing said blanks respectively onto succesive closures on the supporting means, operating said supporting means to 70 carry the closures containing said unfinished blanks to gasket molding position, and there, while the closures are on said supporting means, pressing and molding the blanks to shape the gaskets and adhere the same to the closures. 75

2. The process as defined in claim 1, in which

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the temperature of the closures and the blanks carried thereby is controlled by heat transfer between the supporting means and the closures when the latter are approaching and are at molding positions to facilitate the molding of the gasket and its adherence to the closure.

3. The process as defined in claim 1, in which the strip of gasket material is blanked out so as to leave the strip continuous, and in which the blanked out strip of gasket material is fed back 10 to the plasticizer to be commingled with the gasket material therein.

4. The process as defined in claim 1, in which the gasket material is a vulcanizable rubber compound, and in which, after the gasket is molded to shaape, the closures are passed through a curing oven to vulcanize the gasket.

5. The process as defined in claim 1, in which the gasket material is a vulcanizable rubber com-20 pound, and in which the blanked out strip of unvulcanizable rubber material is continuous and is fed back to the plasticizer to be commingled wth the gasket material therein.

6. In the process of producing sealing closures 25 for containers, the steps of milling a quantity of rubber-like gasket material, removing a continuous strip of said material from the mill, feeding the strip of material past a dial, depositing closures on the dial, cutting measured quanti-30 ties of said material from the strip adjacent the dial, depositing the same quantities respectively into successive closures on the dial, advancing the dial and closures containing the gasket material, and pressing and molding the material to shape 35 the material to provide finished gaskets and adhere said gaskets to the closures while the latter are on the dial, to form liners on the closures.

7. In the process of producing sealing closures for containers, the steps of milling a quatity of rubber-like gasket material, removing a continuous strip of said material from the mill, feeding the strip of material past a dial, depositing closures on the dial, cutting blanks of said material from the strip adjacent the dial, de-45 positing the said blanks respectively into closures on the dial, advancing the dial and successive closures containing the blanks, pressing and molding the blanks to shape the material to form finished gaskets and adhere said gaskets to the 50 closures while the latter are on the dial, to form liners on the closures, and feeding the blanked strip of gasket material back into the mill to replenish the quantity therein.

8. In the process of producing sealing closures 55for containers, the steps of milling a quantity of rubber-like gasket material, removing a continuous strip of said material from the mill, feeding the strip of material past a punch with an intermittent movement, taking up the slack in 60 the strip of material emerging from the mill when the material at the punch is at rest, blanking a measured quantity of said material from the strip when at rest with the punch, depositing the blanked material in a closure, and pressing and 65 molding the blanked material to the closure to form a liner thereon.

9. In the process of producing sealing closures for containers, the steps of milling a quantity of rubber-like gasket material, removing a continuous strip of said material from the mill, feeding the strip of material past a punch with an intermittent movement, taking up the slack in the strip of material emerging from the mill when the material at the punch is at rest, blanking a measured quantity of said material from the strip

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when at rest with the punch, depositing the blanked material in a closure, pressing and moldind the blanked material to the closure to form a liner thereon, feeding the blanked strip back into the mill, and taking up the slack in the blanked strip incidental to its intermittent movement.

10. In the process of producing sealing closures for containers, the steps of milling between mill rollers a bank of plastic gasket material until one of the mill rollers has an enveloping surface layer of plasticized material of the desired degree of plasticity and of predetermined thickness, cutting from part of the layer on the mill roller a continuous ribbon of plasticized material slightly wider than the gasket to be formed, the gap thus formed in the layer being continuously filled by distribution of the bank between the mill rollers, guiding said ribbon to a blanking zone, there passing the ribbon between punch and die elements to cut gasket blanks from the ribbon, guiding the skeletonized ribbon from which the blanks are cut back to the mill roller to commingle with the bank of material thereon, advancing to the assembly station a succession of closures, inserting successive blanks into successive closures, advancing the closure and the blank contained therein to a molding zone, and there molding the blank to desired form with sufficient pressure to cause it to adhere to the closure.

11. In apparatus for applying gaskets to the undersides of closures for containers, means for plasticizing a quantity of moldable vulcanizable gasket material and producing a continuous strip of said material; traveling supporting means having nests for supporting and positioning closures; means for guiding the strip of gasket material from the plasticizing means to a cutting position over said supporting means; means located over said supporting means and in the said path of the strip for successively cutting and completely severing unfinished gasket blanks from said strip and depositing said blanks in said

closures; separate means for molding the blank on the closure to form a gasket; and means for feeding the blanked out strip of gasket material back to the plasticizing means to commingle with the material therein.

12. In apparatus for applying gaskets to the undersides of closures for containers, means for plasticizing a quantity of moldable vulcanizable gasket material and producing a continuous strip of said material; traveling supporting means having nests for supporting and positioning closures; means for guiding the strip of gasket material from the plasticizing means to a cutting position over said supporting means; means located over said supporting means and in the said path of the strip for successively cutting and completely severing unfinished gasket blanks from said strip and depositing said blanks in said closures; means for operating said supporting means to feed the blank containing closures to molding position; and means operating at said molding position to shape the gaskets and adhere the same to the closures while the latter are on said supporting means.

13. In apparatus for applying gaskets to the undersides of closures for containers, means for plasticizing a quantity of moldable vulcanizable gasket material and producing a continuous strip of said material; traveling supporting means having nests for supporting and positioning closures; 75 means for guiding the strip of gasket material

from the plasticizing means to a position over a path intersecting said supporting means; reciprocating die means over said supporting means movable across the path of movement of said strip for successively blanking unfinished gaskets from 5 said strip, said die depositing said blanks in said closures; and means for feeding the blanked-out strip of gasket material back to the plasticizing means to commingle with the material therein.

14. In apparatus for applying gaskets to the 10 undersides of closures for containers, means for plasticizing a quantity of moldable vulcanizable gasket material and producing a continuous strip of said material; traveling supporting means having nests for supporting and positioning closures; means for guiding the strip of gasket material from the plasticizing means to a position over a path intersecting said supporting means; reciprocating die means over said supporting means movable across the path of movement of said strip for successively blanking unfinished gaskets from said strip, said die depositing said blanks in said closures; means for operating the supporting means to feed the blank-containing closures to molding positions; and reciprocating die means 25 for pressing and molding said unfinished blanks to shape the gaskets and adhere the same to the closures.

15. In apparatus for applying gaskets to the undersides of closures for containers, means for 30 plasticizing a quantity of moldable vulcanizable gasket material and producing a continuous strip of said material; a dial having nests for supporting and positioning closures; means for guiding the strip of gasket material along a path over- 35 lapping the path of movement of said closures on the dial; means for successively blanking unfinished gaskets from said strip where the path of movement of the strip and the path of movement of the dial supported closures overlap and 40 depositing said blanks in said closures; and means for feeding the blanked out strip of gasket material back to the plasticizing means to commingle with the material therein.

16. Apparatus for producing sealing closures 45 for containers comprising mill rollers between which a quantity of plastic gasket material is milled until one of the mill rollers has an enveloping surface layer of plasticized material of the desired degree of plasticity and of predeter- 50 mined thickness; means for cutting from part of the layer on the mill roller a continuous ribbon of plasticized material slightly wider than the gasket to be formed; means independent of the mill rollers for cutting and removing from said ribbon gasket blanks; means for guiding the skeletonized ribbon from which the blanks are cut back to the mill roller to commingle with the material thereon; means for advancing to a predetermined position a succession of closures in which said gasket blanks are deposited; and molding means operating in coordination with said blank cutting and closure advancing means for molding the gasket blank in the closure and cause it to adhere thereto.

17. Apparatus for applying liners of rubberlike gasket material to the undersides of closures, comprising means for punching blanks from a continuous strip of said material and for depositing the said blanks respectively into successive closures, all with a continuous movement; means for transporting the closures and blanks deposited therein to a molding station; means for heating the closures during such transportablanks deposited in the closures to shape said blanks to provide finished gaskets and adhere said finished gaskets to the closures at said molding station, to form liners on the closures.

18. Apparatus for applying liners of rubber-like gasket material to the undersides of closures, comprising means for supplying measured quantities of said material successively; means for transferring the said quantities respectively into successive closures; means for transporting the closures and quantities of material deposited therein to a molding station; means for heating the closures and gasket material during their transportation; and means for pressing and mold-15 ing the gasket material in the closures to shape said material to provide finished gaskets and adhere said finished gaskets to the closures at said molding station, to form liners on the closures.

19. Apparatus for applying liners of rubber-20 like gasket material to the undersides of closures, comprising means for supplying a continuous strip of said material; means for cutting measured quantities from said strip; and transferring the measured quantities respectively into successive closures; means for transporting the closures and material deposited therein to a molding station; means for heating the closures and deposited materials during their transportation; and means for pressing and molding the gasket material in the closures to shape said material to provide finished gaskets and adhere said gaskets to the closures at said molding station, to form liners on the closures.

20. Apparatus for applying liners of rubberlike gasket material to the undersides of closures, comprising supply means for producing a continuous strip of said material; means for cutting blanks from said strip; and transferring the cut blanks respectively into successive closures; means for transporting the closures and blanks deposited therein to a molding station; means for heating the closures and blanks during their transportation; means for pressing and molding the blanks in the closures to shape said blanks to provide finished gaskets and adhere said gaskets to the closures at said molding station to form liners on the closures; and means for feeding the blanked strip back into the supply means, to replenish the gasket material therein.

21. Apparatus for applying liners of rubberlike gasket material to the undersides of closures, comprising a mill for working the material and supplying the same in strip form; 55 means for cutting blanks from said strip; and transferring the cut blanks respectively into successive closures; means for transporting the closures and blanks deposited therein to a molding station; means for heating the closures and 60 blanks during their transportation; and means for pressing and molding the blanks in the closures to shape said blanks to provide finished gaskets and adhere said gaskets to the closures at said molding station, to form liners on the 85 closures.

22. Apparatus for applying liners of rubberlike gasket material to the undersides of closures, comprising a tool for cutting successive measured quantities from a strip of said mate-70 rial; a dial; means carried by the dial for receiving and supporting the closures, said dial carrying the closures in succession past the tool to a molding station, and the said tool depositing the measured quantities succesively in the tion; and means for pressing and molding the 75 said closures; means for heating the closures

while supported by the dial; and means for pressing and molding the measured quantities of gasket material to shape the material to provide finished gaskets and adhere said gaskets to the closures while on the dial at the molding sta- 5 tion, to form liners on the closures.

23. Apparatus for applying liners of rubberlike gasket material to the undersides of closures, comprising means for supplying a strip of said material; a tool for cutting successive meas- 10 ured quantities from the strip; a dial; nests carried by the dial for receiving and supporting the closures, said dial carrying the closures in succession past the tool to a molding station, and the said tool depositing the measured quantities 15 successively in the said closures; means carried by the dial, for transferring heat to the closures; and means for pressing and molding the measured quantities of gasket material to shape the material to provide finished gaskets and adhere 20 said gaskets to the closures while on the dial at the molding station, to form liners on the closures.

24. Apparatus for applying liners of rubberlike gasket material to the undersides of clo- 25 sures, comprising a mill for working said material and supplying the same in strip form; a blanking tool for cutting successive blanks from the strip of gasket material; a dial; means carried by the dial for receiving and supporting the 30 closures, said dial carrying the closures in succession past the blanking tool to a molding station, the said tool depositing the blanks successively in the said closures; means associated with the dial for heating the closures; means 35 for pressing and molding the blanks to shape the material to provide gaskets and adhere said gaskets to the closures while at the molding station, to form liners on the closures; means for 40 ejecting the lined closures from the dial; and means for feeding the blanked strip of gasket material back into the mill, to replenish the supply therein.

25. Apparatus for applying liners of rubberlike gasket material to the undersides of clo- 45 sures, comprising a mill for working said material and supplying the same in strip form; a blanking tool for cutting successive blanks from the strip of gasket material; means for taking up the slack in the strip, between the mill and 50 the blanking tool; a dial; means carried by the dial for receiving and supporting the closures, said dial carrying the closures in succession past the blanking tool to a molding station, the said tool depositing the blanks successively in the 55 said closures; means associated with the dial for heating the closures; means for pressing and molding the blanks to the closures while at the molding station, to form liners on the closures; means for ejecting the lined closures from the 60 dial; and means for feeding the blanked strip of gasket material back into the mill, to replenish the supply therein.

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26. A machine which comprises means for plasticizing gasket-forming material, a blanking station and a molding station, means for guiding a strip of said plasticized material past said blanking station, means at said blanking station for forming a blank and depositing said blank in a closure member, means for transferring the closure member and associated blank to said molding station and heating said blank to a molding temperature during transfer thereof, and means at said molding station to mold said blank in said closure member under sufficient pressure to shape the blank to provide a finished gasket in the form of a gasket ring surrounding an inner membrane of less thickness than said ring and simultaneously adhere said gasket to said closure.

27. A machine comprising in combination, means for plasticizing a batch of gasket-forming material and forming a continuous strip thereof, a blanking station, a molding station, means for guiding said strip past said blanking station and returning the skeletonized strip to said batch for reuse, a heated rotatable table having a plurality of closure member holding means for supporting a series of closure members for movement on said table past said blanking and molding stations, a reciprocating punch at said blanking station for forming a blank from said strip and depositing it in an adjacent closure on said table for transfer therewith upon rotation of said table to said molding station, and a reciprocating die at said molding station for molding said blank in place in the closure member to shape the blank to provide a finished gasket and simultaneously adhere the gasket material to the closure member.

HENRY Z. GORA.

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1,626,412	James	Apr. 26, 1927
1,858,279	Parker	May 17, 1932
1,993,082	Blair et al	Mar. 5, 1935
2,059,554	Cohn	Nov. 3, 1936
2,103,860	Mazzeo	Dec. 28, 1937
2,130,746	Scofield	Sept. 20, 1938
2,166,490	Gora	July 18, 1939
2.167,734	Zonino	Aug. 1, 1939
2,269,441	Holczer	Jan. 13, 1942
2.304.141	Bergmann	Dec. 8, 1942