

April 22, 1958

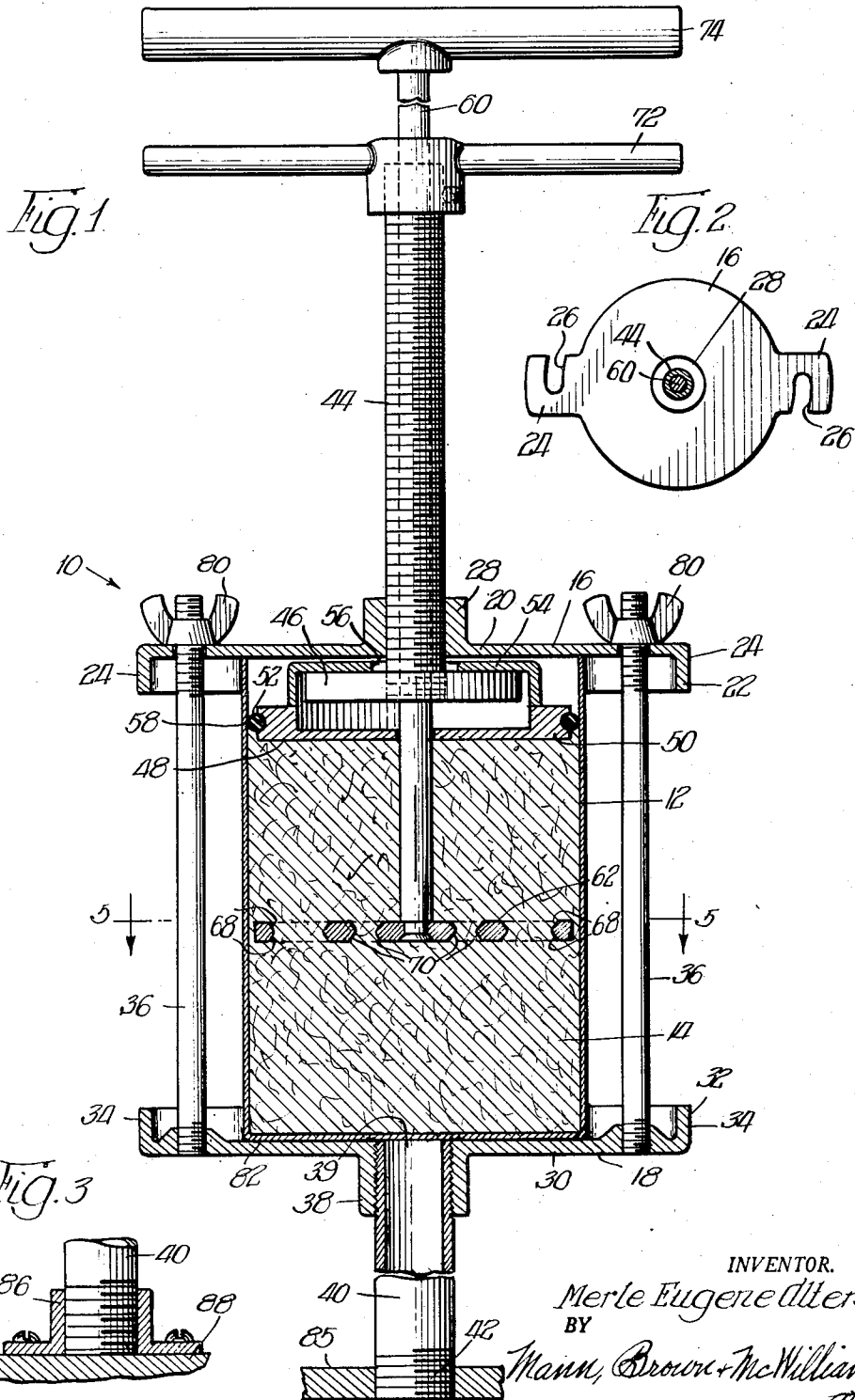
M. E. ALTERS

2,831,606

METHOD AND DEVICE FOR KNEADING AND REMOVING A
VISCOUS MATERIAL FROM ITS CONTAINER

Filed Nov. 16, 1956

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Fig. 4

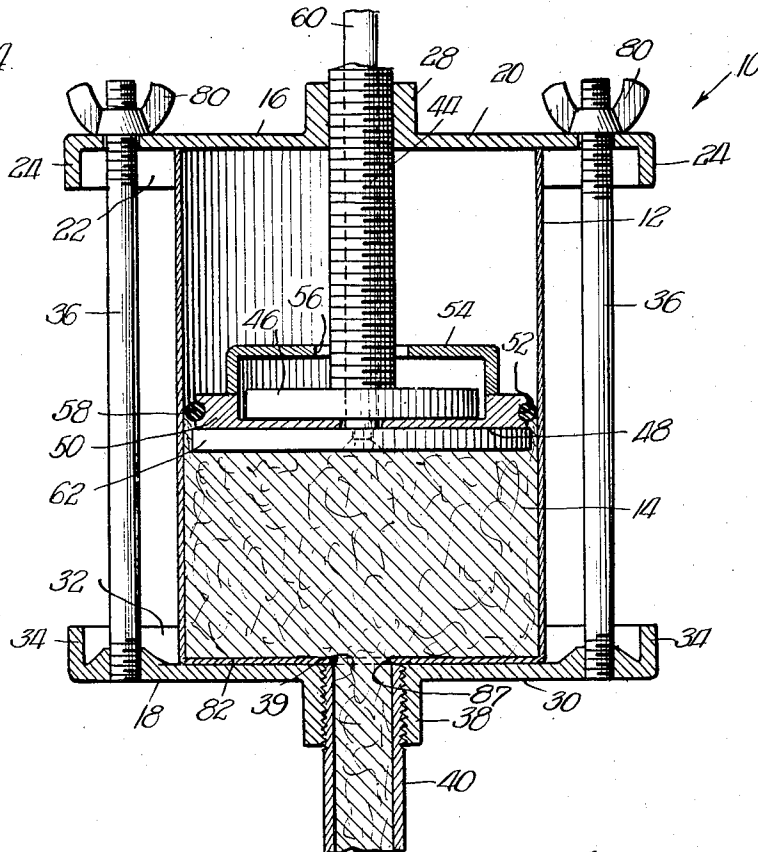


Fig. 5

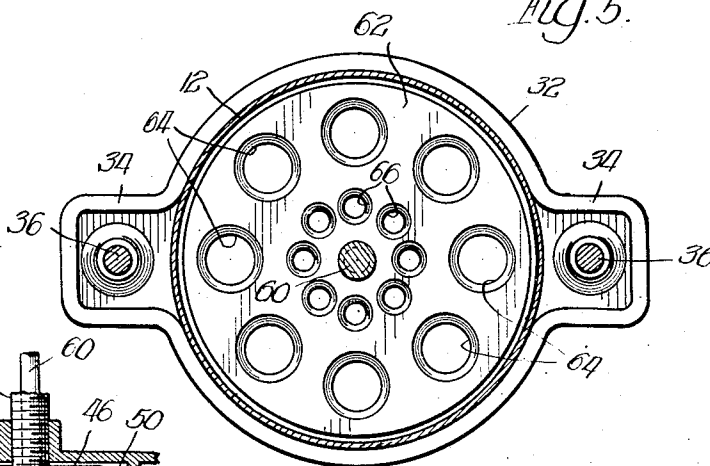
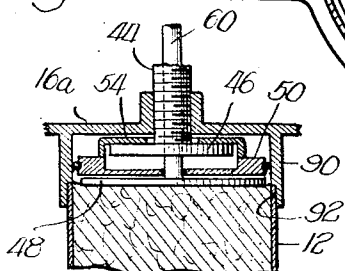


Fig. 6



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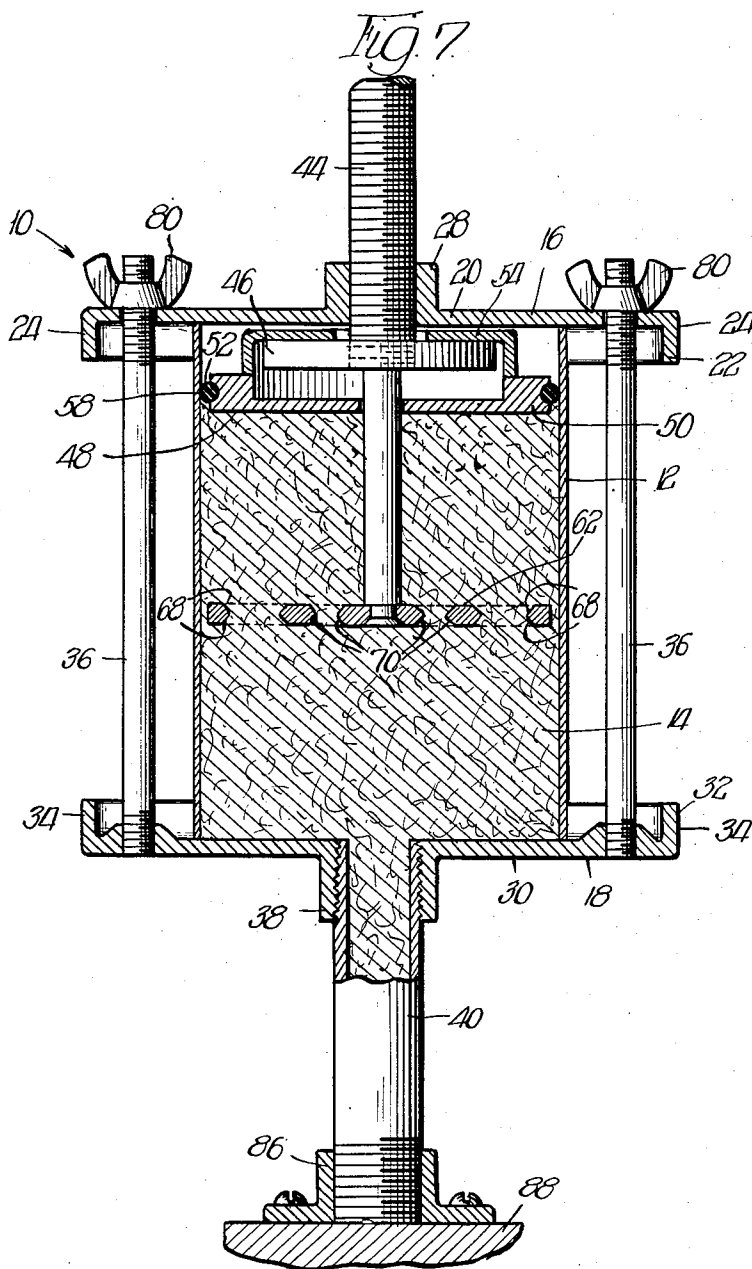
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METHOD AND DEVICE FOR KNEADING AND REMOVING A VISCOUS MATERIAL FROM ITS CONTAINER

Merle Eugene Alters, Beloit, Wis.

Application November 16, 1956, Serial No. 622,672

14 Claims. (Cl. 222—1)

My invention relates to a method and device for kneading and removing a viscous material from its container, and more specifically, to a method and device for handling and applying a highly viscous sealing compound to high pressure gas line conduits and associated structures, though the method and device are of general application.

In the application of myself and Robert M. Soehnlen, Serial No. 435,726, filed June 10, 1953, the disclosure of which is hereby incorporated herein by reference, a compound injector of the type to which my invention relates is disclosed. In this compound injector, the top of the container is removed from the container and the bottom thereof is detached therefrom to act as a ram or plunger head for forcing the compound from the container. My invention is an improvement over the device disclosed in said application.

The preferred sealing material or compound employed for sealing leaky gas line joints, cracks, and the like is a highly viscous, sticky substance, which heretofore has rendered the material very difficult to remove from its container and apply where and as desired. An example of this material is the plastic base compound known in the art as polysulfide elastomer, a product of Minnesota Mining and Manufacturing Company.

Also, the compound and similar materials frequently require mixing and/or kneading before they are used. Heretofore, those doing the required mixing and/or kneading inevitably would get some of the material on themselves as well as their clothes, which is highly undesirable due to the characteristics of the material. This is frequently very dangerous as the compound may be highly toxic in nature.

The principal object of my invention is to provide a device for kneading the compound within its container and removing the compound from its container which insures that the operator does not come into contact with the compound itself.

Another principal object of the invention is to provide an improved method of handling materials of this sort.

A further object of the invention is to provide a device for handling highly viscous compounds which permits kneading of the compound within its container before removing same from its container, all without requiring that the operator contact the compound in any way.

A further object of the invention is to provide a viscous material injection device which is arranged so that the container for the compound acts as the material containing cylinder for the device.

Yet a further object of the invention is to provide a viscous compound or material kneading and injecting device which is composed of few and simple parts, is economical of manufacture, is convenient in use, and is adapted to handle a wide variety of viscous and other plastic and semi-plastic substances.

Other objects, uses, and advantages will be obvious or

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become apparent from a consideration of the following description and the application drawings.

In the drawings:

Figure 1 is a longitudinal sectional view through one embodiment of my invention, showing the compound container in kneading and injecting position, with the kneading device being applied to the compound;

Figure 2 is a top plan view of the top clamping member of the device as shown in Figure 1;

Figure 3 is a fragmental sectional view illustrating the nozzle of the device of Figure 1 applied to a fitting that may be secured to the operator's work truck or the like;

Figure 4 is a view similar to that of Figure 1 showing the device plunger being applied to the compound, parts being broken away;

Figure 5 is a cross sectional view along line 5—5 of Figure 1;

Figure 6 is a fragmental longitudinal cross sectional view illustrating a modification of the invention; and

Figure 7 is a view similar to that of Figure 1, showing an alternate method of kneading the compound.

Reference numeral 10 of Figure 1 generally indicates my improved device as a whole in which a container 12 containing sealing compound 14 has been mounted. The device 10 generally comprises spaced cap, holder, or clamping members 16 and 18 positioned in abutting relation with the respective ends of the container 12. The member 16 in the illustrated embodiment includes a substantially flat wall 20 rimmed by an integral flange 22. The member 16 is formed with diametrically opposed ears 24 which are formed with bayonet type locking slots 26 (see Figure 2). The member 16 also includes an internally screw threaded boss 28.

The member 18 has a configuration generally similar to that of the member 16 and includes the relatively flat wall 30 rimmed by flange 32 and formed with ears 34. The ears 34 of the member 18 fixedly carry elongate bolts 36 that are adapted to cooperate with the bayonet slots 26 of the member 16 in the manner hereinafter described. The member 18 also includes an internally screw threaded boss 38 forming an outlet port 39 in which is received a nozzle 40 that in the illustrated embodiment is provided with external screw threading 42 on its outer end.

The member 16 screw threadedly receives a tubular piston rod 44, which is provided with appropriate screw threading on its external surface. A disc 46 perforated at its center is fixed to the inner end of the tubular piston rod 44, as by force fitting it over this end or by welding it to this end. A plunger or ram 48 is secured to the inner end of piston rod 44, and preferably is mounted for free rotational movement with respect to the piston rod 44 and floating movement laterally of the container 12. In the illustrated embodiment, the plunger or ram 48 comprises a disc like element 50 formed with a recess 52 in its periphery, onto which is secured a cup-shaped element 54 apertured as at 56. The cup-shaped member 54 is secured to the disc like element 50 in any suitable manner, as by welding, with the disc 46 positioned therebetween. The disc 46 and perforation 56 are proportioned to permit limited lateral movement of plunger or ram 48 with respect to the rod 44. An O-ring seal 58 is mounted in the recess 52 to act as a gasket or piston ring between the plunger or ram 48 and the internal surface of the container 12.

A rod 60 extends through the tubular piston rod 44 and fixedly carries a kneading disc 62 at its innermost end. The disc 62 is preferably apertured as at 64 and 66 in the manner indicated in Figure 5, the apertures preferably being countersunk as at 68 and 70 (see Figure 1). A handle element 72 is keyed to the tubular piston rod 44

in any suitable manner and a similar handle element 74 is keyed or otherwise fixed to the end of the rod 60.

In use, the container 12 in which, for instance, the compound above mentioned is ordinarily supplied, which is a metal container of the well-known cylindrical type, is modified by removing its top by employing a can opener or the like. The member 18 is then placed against the bottom end of the can and the member 16 is placed against the top end of the can in the manner indicated in Figure 1, and the member 16 is twisted to position the threaded ends of the bolts 36 in the bayonet slots 26. Wing-nuts 80 are then applied to the bolts 36 to clamp the members 16 and 18 against the respective ends of the container.

If desired, a disposable gasket may be interposed between the end 82 of the container 12 that is positioned adjacent member 18. This gasket may be shaped from a readily disposable material, such as cardboard. When member 16 is applied to the container 12, the kneading disc 62 will be positioned in abutting relationship with the working surface of the ram or plunger 48.

The threaded end 42 of nozzle 40 is then attached to some convenient stationary holding device. This may be a device into which the compound 14 is to be injected, such as the wall 85 of a leak clamp of the type described in the application of myself and Robert M. Soehnlen, Serial No. 435,727, filed June 10, 1954, the disclosure of which is hereby incorporated by reference. Alternately, the threaded end 42 may be received in a threaded fitting 86 secured to the body 88 of the work truck or secured to any other relatively stationary object.

The compound may then be mixed and kneaded by pushing and pulling the handle 74 to move the kneading disc 62 back and forth in the direction of the arrows of Figure 1. The disc 62 may be moved between the upper and lower limits of the body of compound in the container 12. The compound on moving through the perforations 64 and 66 is first contracted and then expanded, which provides an unusually effective kneading action on the compound. It is recommended that the disc 62 be rotated somewhat after each back and forth movement thereof so that the kneading action provided by the disc 62 is applied to all of the compound 14.

After the compound has been sufficiently kneaded, the kneading disc 62 is drawn against the ram or plunger 48 and a pointed tool is forced through the bottom 82 of the container to form a port 87. When it is desired to force compound from the device 10, the handle 72 is rotated in the appropriate direction to draw the ram or plunger 48 and the disc 62 in front of it against the compound, which forces the compound through the perforation in the gasket 82 and out of the nozzle 40.

As the plunger or ram 48 is permitted to move laterally of the container, it follows or floats with the interior surface of the container, which permits it to efficiently force compound past and away from dents in the container. The O-ring seal 58 insures that no compound will escape from between the ram or plunger 48 and the interior surface of the container.

It will be appreciated that my device keeps the compound entirely inside the container until it is needed, even during the mixing and/or kneading thereof. Some containers will require that a small portion of the compound be removed from the container to permit the plunger or ram 48 and the kneading disc 62 to be positioned in the initial position required to apply the clamping member 16. Where this is necessary, this small amount of compound can be removed safely by a convenient tool. This may be rendered unnecessary by interposing a depending circular rib 90 between the wall 20 of modified member 16a and the rim of the can, as diagrammatically indicated in Figure 6. The rib 90 may be appropriately notched as at 92 to receive the end of the can.

It may be mentioned that the aforementioned compound requires the addition of an accelerator material before it is used. This accelerator material must be thor-

oughly mixed with the compound and I have found that the device 10 is an effective instrument for doing so. The accelerator is placed on top of the compound before the member 16 is applied to the container.

In the alternative way of doing the mixing shown in Figure 7, both ends of the container are removed, and then the nozzle 40 is attached to a flow blocking device such as fitting 86 of Figure 3. The mixing and kneading is then done as described above after which the nozzle 40 is removed from fitting 86 and the compound is forced from the device by rotating handle 72.

I have found it convenient to form the tubular piston rod 44 from standard double strength pipe of a suitable diameter. The pipe should be at least double strength so that it will be sufficiently strong after it is externally screw threaded. The device 10 as illustrated is designed for use with quart sized cans, though the amount of compound in the container will vary depending upon the use to which it is to be put.

The foregoing description and the drawings are given merely to explain and illustrate my invention, and the manner in which it may be performed, and the invention is not to be limited thereto, except in so far as the appended claims are so limited, since those skilled in the art who have my disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. A device for kneading a plastic material within its container from which the top has been removed and for removing the material from its container comprising a pair of clamping members, said container being received between said members, means for clamping said members against the ends of the container, a plunger element carried by one of said members, the other of said members being formed with an outlet port that is positioned in communication with an opening formed in the bottom end of the container, means for forcing said plunger element against the plastic material to push the material out of the container and through said port, and means associated with said plunger element for kneading said material before the opening is formed in the bottom of the container and the material is pushed from the container.

2. A device for kneading a plastic material within its container from which one end thereof has been removed comprising holder means for immobilizing the container, plunger means carried by said holder means and positioned in alignment with the open end of the container, said plunger means carrying means for kneading the plastic material inwardly of said plunger means with respect to the container, means for reciprocating said plunger means, and means for separately reciprocating said kneading means with respect to said plunger means.

3. A device for kneading a plastic material comprising an open ended container, said material being disposed in said container, ram means aligned with said open end of said container, means for reciprocating said ram means within said container, kneading means associated with said ram means for kneading said material in advance of said ram means, and means for separately reciprocating said kneading means with respect to said ram means.

4. A device for kneading a plastic material comprising an open ended container formed with an outlet port in its other end, said material being disposed in said container, means for temporarily blocking said outlet port, ram means aligned with said open end of said container, means for reciprocating said ram means within said container, kneading means associated with said ram means for kneading said material in advance of said ram means, said kneading means comprising a disc like member formed with a plurality of perforations, and means for reciprocating said disc like member independently of said ram means.

5. A device for kneading a plastic material comprising an open ended container formed with an outlet port

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in its other end, said material being disposed in said container, means for temporarily blocking said outlet port, ram means aligned with said open end of said container, means for reciprocating said ram means within said container, kneading means associated with said ram means for kneading said material in advance of said ram means and between said ram means and said other end of said container, said kneading means comprising a disc like member formed with a plurality of perforations, and means for reciprocating said disc like member independently of said ram means, said ram means being substantially coextensive with the interior of said container and blocking said open end of said container upon reciprocation of said disc like member.

6. A device for kneading a plastic material within its container from which the top and bottom have been removed and for removing the material from its container comprising means for rigidly grasping the container at its ends, plunger means aligned with one open end of the container, outlet conduit means associated with the other open end of the container, means for reciprocating said plunger means within the container, kneading means associated with said plunger means for kneading the material in advance of said plunger means and between said plunger means and said other end of the container, means for actuating said kneading means independently of said plunger means, and means for temporarily blocking said outlet conduit means during operation of said kneading means.

7. A device for kneading a plastic material within its container from which the top and bottom have been removed and for removing the material from its container comprising spaced holder elements adapted to be disposed in engagement with the respective ends of the container, means for clamping said holder elements against the respective ends of the container, one of said elements carrying a tubular piston rod, a plunger secured to the inner end of said rod, said plunger being formed with a perforation aligned with said piston rod, disc like kneading means associated with said plunger, means extending through said piston rod and the perforation of said plunger for reciprocating said kneading means independently of said plunger, and means for reciprocating said plunger within the container, the other of said holder elements being formed with an outlet conduit aligned with the adjacent open end of the container, and means for temporarily blocking said outlet conduit during operating of said kneading means.

8. The device set forth in claim 7 wherein said plunger is secured to said piston rod for lateral floating movement with respect thereto.

9. The device set forth in claim 7 wherein said tubular piston rod is screw-threadedly mounted in said one holder element, and wherein handle means is secured to said piston rod for rotating said rod with respect to said

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one holder element, the screw threading of said piston rod and said handle means comprising said means for reciprocating said plunger.

10. The device set forth in claim 7 wherein said disc like kneading means is formed with a plurality of countersunk perforations.

11. The device set forth in claim 7 wherein said means extending through said piston rod and the perforation of said plunger for reciprocating said kneading means comprises a slidably mounted rod like element, and wherein handle means is secured to the outwardly extending end of said rod like element.

12. A device for kneading a plastic material within its container from which the top and bottom have been removed and for removing the material from its container, comprising spaced holder elements adapted to be disposed in engagement with the respective ends of the container, means for clamping said holder elements against the respective ends of the container, one of said holder elements screw-threadedly carrying a tubular piston rod screw-threadedly mounted in one of said holder elements, a plunger secured to the end of said rod, said plunger being formed with a perforation aligned with said piston rod, a rod like element extending through said piston rod and the perforation of said plunger, a kneading disc secured to the end of said rod like element, handle means secured to said piston rod for rotating said piston rod to reciprocate said plunger within the container, handle means secured to said rod like element for reciprocating said kneading disc within the container independently of said plunger, the other of said holder elements being formed with an outlet conduit aligned with the adjacent open end of the container, and means for temporarily blocking said outlet means during operation of said kneading means.

13. The method of kneading and removing a plastic material from its container including the steps of removing the top and bottom of the container, sealing off the opened top and bottom of the container, kneading the material within the container, opening one end of the container and then forcing the material out of said one end of the container.

14. The method of kneading and removing a plastic material from its container including the steps of removing the top of the container, sealing off the opened top of the container, kneading the material within the container, forming a hole in the bottom of the container, and then forcing the material out of the container through said hole.

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