June 7, 1949. J. W. KUEHN ET AL 2,472,594

APPARATUS FOR PROGRESSIVELY MELTING AND DISPENSING SOLIDIFIED MATERIALS

Filed April 4, 1946

FIG. 1

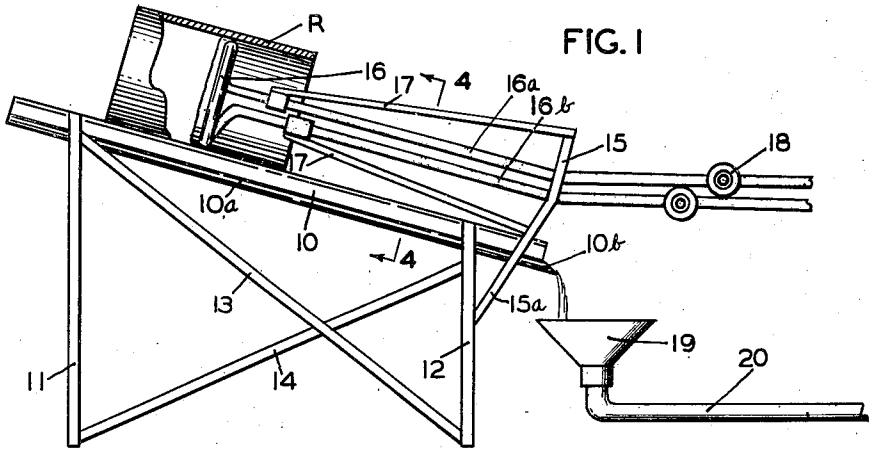


FIG. 2

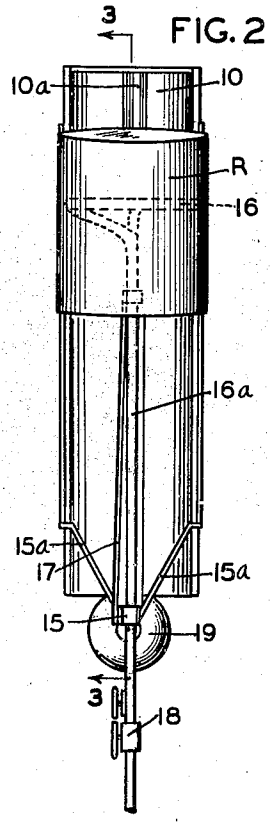


FIG. 3

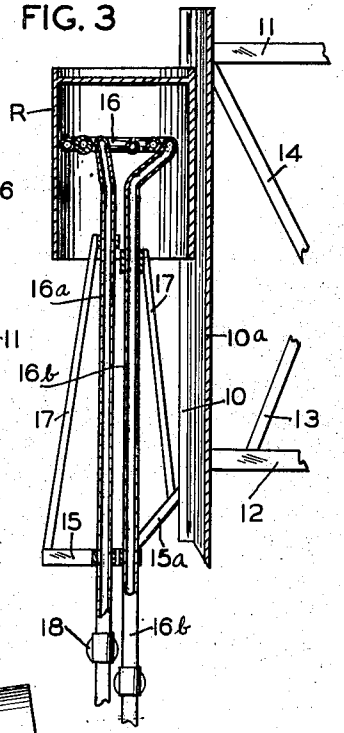


FIG 4

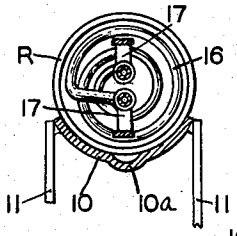


FIG. 5

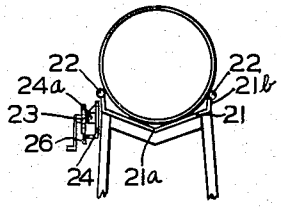
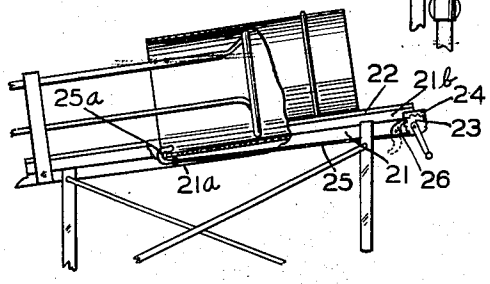


FIG. 6



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APPARATUS FOR PROGESSIVELY MELTING AND DISPENSING SOLIDIFIED MATERIALS

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Application April 4, 1946, Serial No. 659,648

3 Claims. (Cl. 126—343.5)

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This invention relates to apparatus for progressively melting and dispensing solid materials which have relatively low melting points.

The invention has wide applicability but is particularly adapted to progressively melt and dispense materials which are desired to be applied in liquid or semi-liquid form such as shortening materials, greases, tar, soap stocks and the like.

It is an object of our invention to provide a simple and inexpensive apparatus for progressively melting, collecting and discharging in a stream, materials of the class described which are normally contained and shipped within drums, cans or other containers having a removable cover.

Another object is to provide simple and efficient apparatus for receiving an opened receptacle containing materials of the class described and for progressively subjecting the contents of the receptacle to the action of a heated plunger through relative longitudinal movement between the solid mass of material and the plunger with the receptacle in tilted position and for catching the melted material in liquid form as the material flows from the receptacle and for thereafter discharging a stream of the melted material.

More specifically, it is an object to provide in apparatus of the class described, a supporting chute or guideway adapted to receive and through gravity, bring about longitudinal movement of an opened receptacle containing readily meltable solidified material in combination with a heated head or stationary plunger extending longitudinally of and in spaced relation to said chute and in further combination with means defining a trough for catching the material as it melts and for dispensing or discharging the material from a predetermined point of discharge.

These and other objects and advantages of our invention will be more apparent from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same parts throughout the several views and in which—

Fig. 1 is a side elevation of a form of our apparatus showing a cylindrical drum containing a mass of meltable material with portions of the drum broken away to illustrate the carrying out of our method;

Fig. 2 is a top plan view of the same;

Fig. 3 is a section taken longitudinally along the line 3—3 of Fig. 2;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 1 looking in the direction of the arrows;

Fig. 5 is a side elevation of a somewhat different form of our invention with some portions broken away; and

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Fig. 6 is an end elevation of the same.

As shown in the drawings, our apparatus comprises an inclined chute 10 of generally arcuate cross section and supported upon a suitable skeleton frame comprising at each of the longitudinal sides, a pair of legs 11 and 12 cross braced by diagonal braces 13 and 14. Chute 10 is inclined sufficiently from the horizontal to cause through gravity, a drum or other receptacle R to slide longitudinally theredown and preferably, is smoothly surfaced and provided with a longitudinal sump or trough portion 10*a* extending substantially the length thereof and preferably to its lower end where a discharge element as shown, in the form a spout 10*b*, is provided, extending a short distance beyond the lower edge of the chute proper.

Supported from the lower end of chute 10 and its supporting frame is a supporting head 15 disposed transversely of the chute and some distance thereabove. As shown, head 15 is secured by diagonal supporting and bracing members 15*a* to the forward legs 12 of the supporting frame and also to the longitudinal edges of the chute. A melting head or stationary plunger 16 is supported from supporting head 15 over the upper medial portion of chute 10 and spaced therefrom, extending substantially parallel with the axis of chute 10. This melting head or plunger in the form illustrated, constitutes a relatively flat, spiral coil of tubular material through which hot fluid such as steam is adapted to be circulated. The coil 16 as shown, is integrally formed with a pair of longitudinally disposed intake and return conduits 16*a* and 16*b* respectively which extend through the supporting head 15 and are supported therefrom in parallel, spaced relationship to the trough 10. The conduits 16*a* and 16*b* and coil 16 are preferably constructed from rigid, heat transmissive material, such as metal tubing. As shown, the conduits and element 16 are reinforced and braced in their spaced relation to the chute by suitable means such as diagonal brace bars 17 connected at their upper ends to the respective conduits 16*a* and 16*b* at points just rearwardly of the coil 16 and are rigidly connected at their outer ends to the supporting head 15. The control valve 18 is interposed in the intake conduit 16*a* to control flow of the heating fluid through the plunger coil 16.

As shown, the discharge spout 10*b* delivers to a funnel or receiver 19 which is connected with a supply pipe 20.

In operation, a drum, can or other receptacle containing solidified material of the class described, is opened at one end by removal of the cover or cap and thereafter, disposed upon the upper end of chute 10 with its open end directed downwardly. Gravity causes the receptacle with the solidified material therein to slide downwardly until the melting head or plunger 16 is abutted against the material within the receptacle. When valve 18 is opened, heated fluid is circulated through the coil 16 which preferably approximates in its outside or marginal dimensions, the cross sectional area of the mass of solidified material to be melted. The solidified material is thus progressively melted from one end thereof thereby permitting the receptacle and solid mass to very slowly and slidably move longitudinally down chute 10 towards the lower end thereof. As the solidified material melts, the liquid therefrom trickles out of the declined open end of the receptacle, being caught by the bottom of the chute and in the form illustrated, more specifically in the longitudinal trough or sump 10*a* where it flows downwardly in substantially a continuous stream and is discharged by the projecting spout 10*b*. The material then in liquid form may be conducted to a distributor, spray head or other apparatus for use as desired.

From the foregoing description it will be seen that we have provided a very simple but highly efficient method of progressively melting and dispensing a number of solid materials which essentially consists in producing a relative longitudinal movement between a solid mass of a congealed material and a melting head which approximates in outside dimension, the cross sectional area of the mass and thereafter, catching the material as it is progressively melted and discharging the same in a stream.

It will of course, be understood that various changes may be made in the form, details and arrangement of parts of our apparatus without departing from the scope of our invention.

In Figs. 5 and 6 a somewhat different form of the invention is shown, particularly adapted to handle heavy receptacles such as steel barrels. Here, the chute 21 is made of relatively heavy sheet metal of generally U-shaped cross section but channeled on an obtuse angle to form a longitudinal sump 21*a* and the sides 21*b* at their upper longitudinal edges are reinforced by tubular guides 22. A winch 23 is journaled on a suitable bracket 24 mounted at the rear end of the chute and has a cable 25 or other flexible member attached to the drum 24*a* thereof. The lower end of the cable is provided with a hook 25*a* adapted to engage the forward edge of the receptacle whereby after the contents have been completely melted and the receptacle is in lowermost position, the winch may be turned to raise the same for removal from the rear end of the trough.

A pivoted pawl 26 is associated with the winch 23 adapted to engage a ratchet provided at one end thereof whereby the drum may be retained at a desired elevation on its slide. In this connection, if adequate shortening material has been melted and obtained for use before the contents of a drum are consumed, the winch may be operated to pull back the drum to the upper portion of the slide for later use.

What we claim is:

1. Apparatus for progressively melting and dispensing a mass of solidified material from an open ended receptacle comprising an inclined slide for supporting said receptacle containing said material, said slide being inclined so that the receptacle will slide downwardly therealong under the influence of gravity a heating head disposed longitudinally of said slide and spaced thereabove to abut the material within said receptacle, said slide having collection means for receiving the material progressively melted and a winch for pulling a receptacle backwardly to the top of said slide.

2. Apparatus for progressively melting and dispensing a mass of solidified material comprising an inclined slide for supporting a receptacle containing such material, said slide being inclined so that the receptacle will slide downwardly therealong under the influence of gravity a stationary heating head disposed longitudinally of said slide and spaced thereabove, said head being dimensioned and shaped to fit within a receptacle and abut the material therein and means for collecting material progressively melted and for delivering the same at a predetermined point.

3. Apparatus for progressively melting and dispensing a mass of solidified material from an open ended receptacle comprising an inclined member for slidably supporting a receptacle containing such material, said slide being inclined so that the receptacle will slide downwardly therealong under the influence of gravity said member having a collection trough disposed medially of the side thereof and a heating head adapted to be fixedly mounted in use disposed longitudinally of said slide member and spaced thereabove, said heating head being shaped and dimensioned to fit within a receptacle and to abut the material therein.

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