Feb. 23, 1943. R. M. PATTERSON 2,311,773

INSULATION BLOWING MACHINE

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Fig. 1.

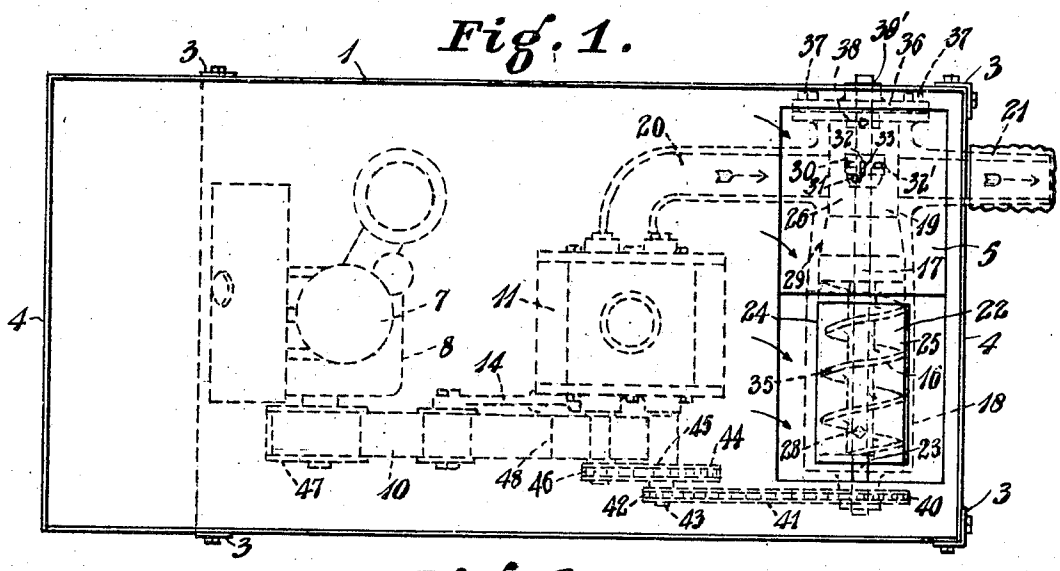


Fig. 2.

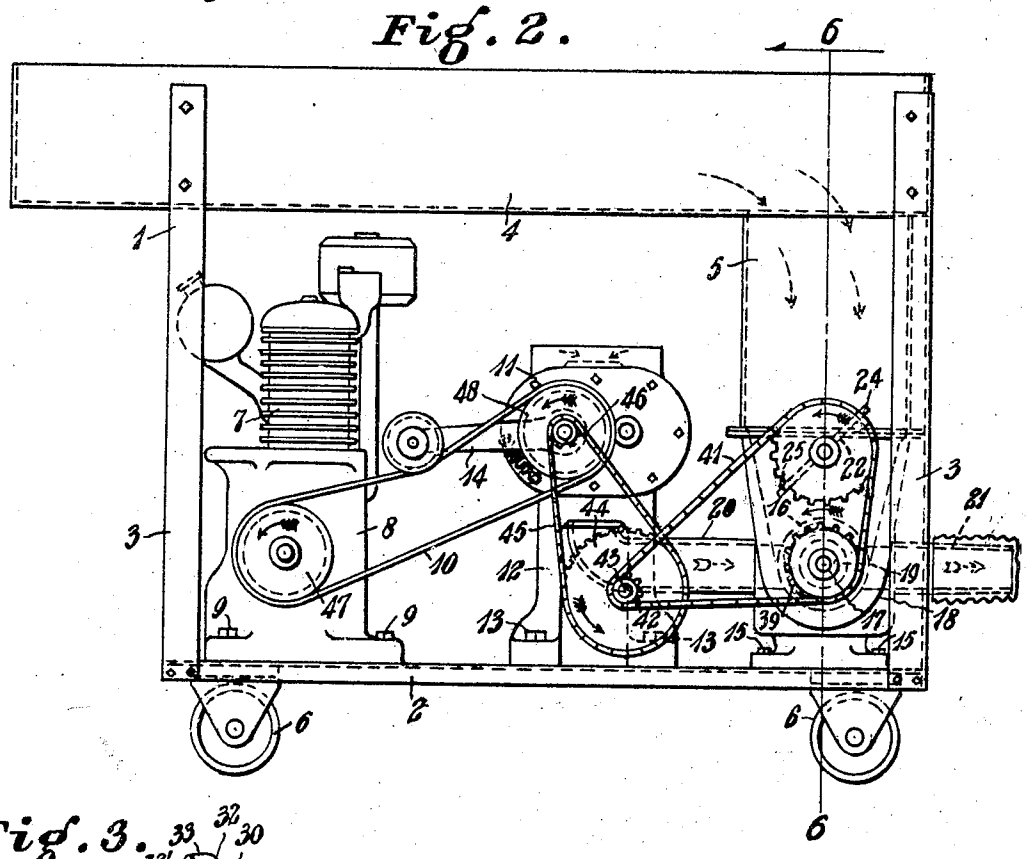
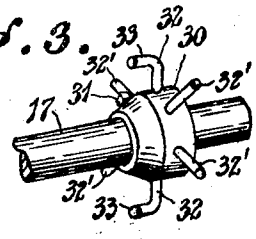


Fig. 3.



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Fig. 4.

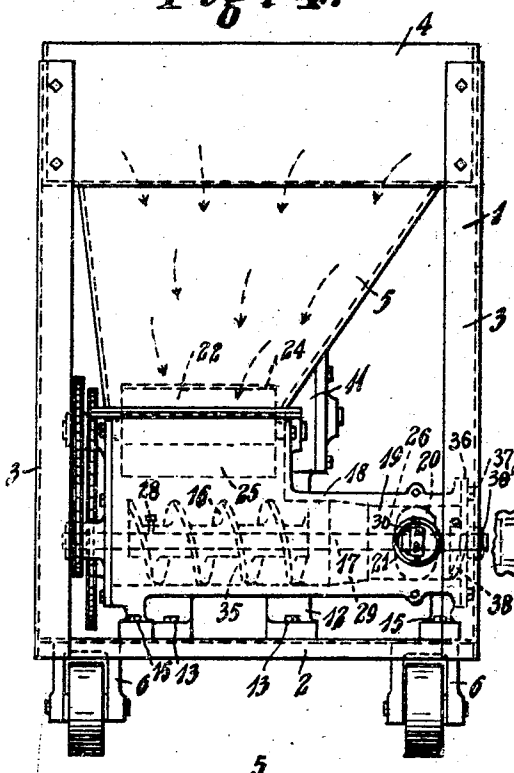
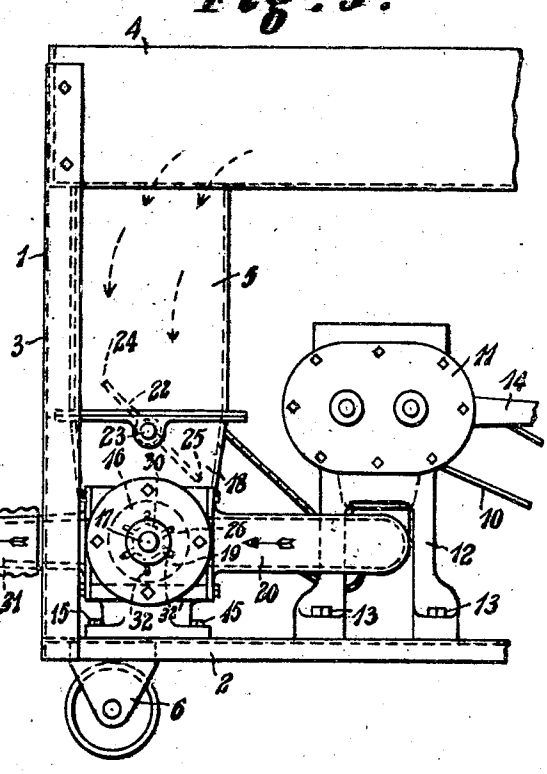


Fig. 5.



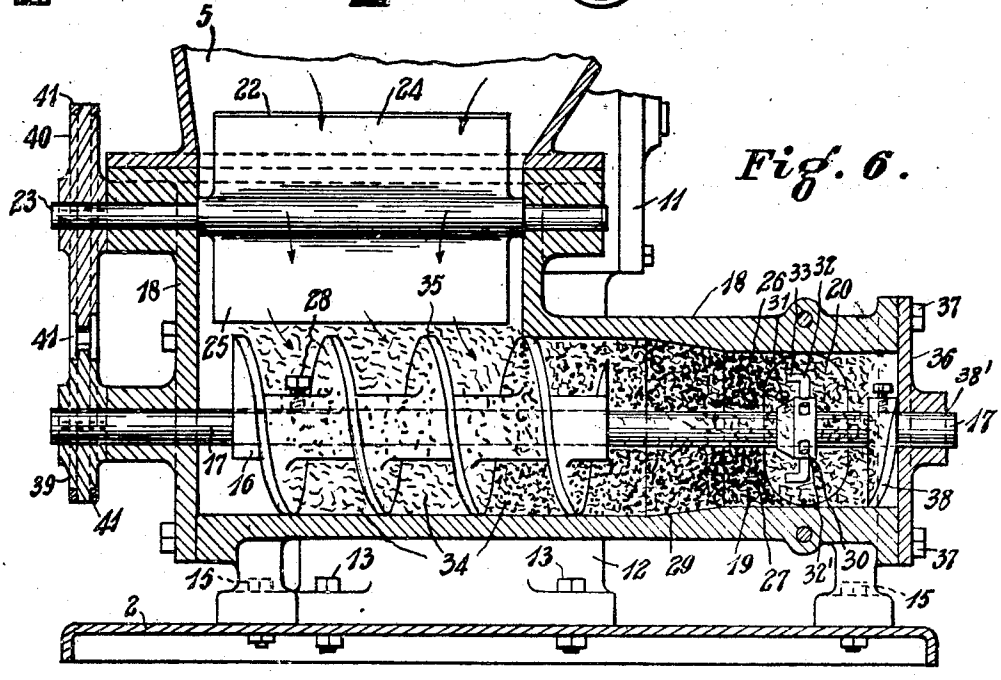


Fig. 6.

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Fig. 7.

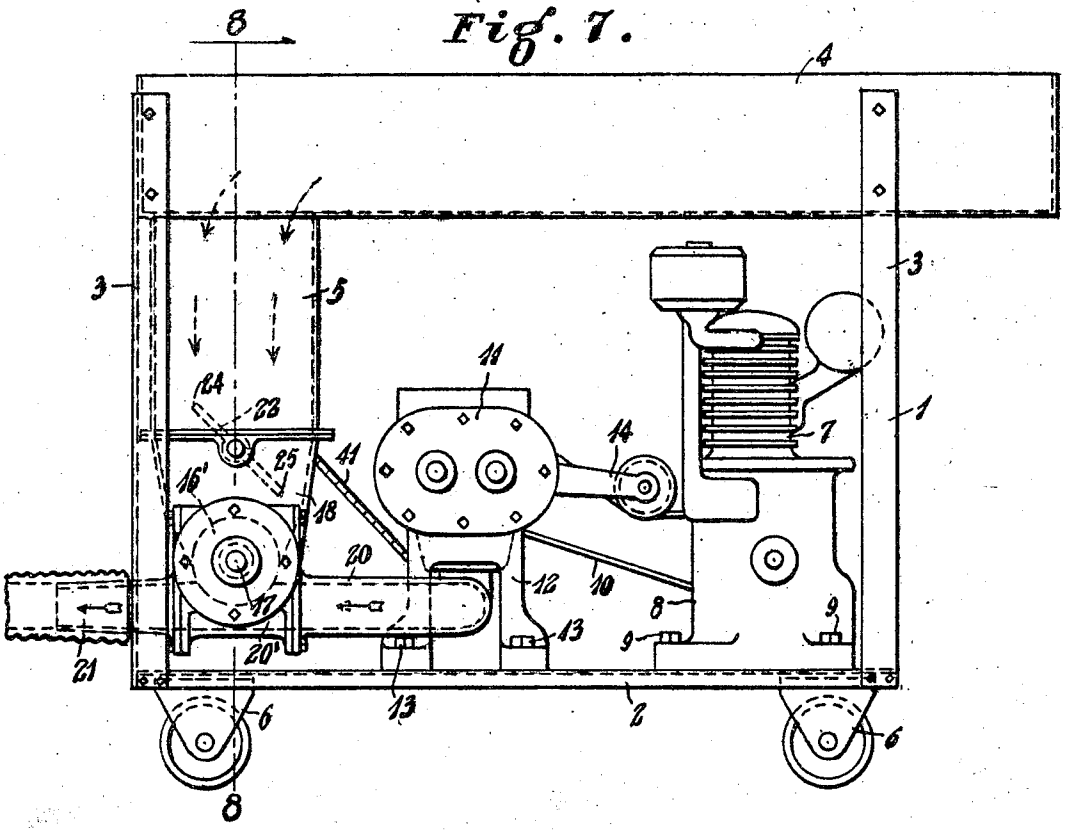
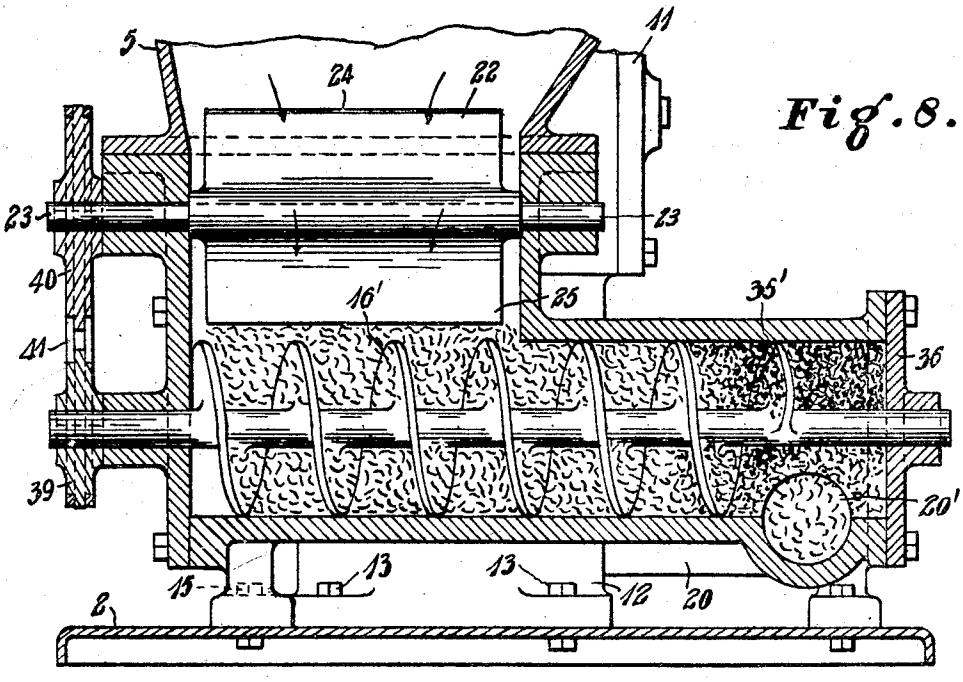


Fig. 8.



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UNITED STATES PATENT OFFICE

2,311,773

INSULATION BLOWING MACHINE

Russell M. Patterson, Chicago, Ill.

Application August 2, 1940, Serial No. 349,992

3 Claims. (Cl. 302—36)

This invention relates to a blowing machine for granulating insulating materials, such as fibrous material of the character of mineral wool and the like, and feeding same into unfilled spaces of walls, partitions and other structures to be filled with the insulating material for insulating the binding structure.

Blowing machines heretofore used for this purpose have employed an air chamber divided by rotatable vanes into a series of radially disposed compartments, one of which would be filled with the insulating material from a hopper while an oppositely disposed filled one would be emptying said material into the air conduit from the blower. In these blowing machines, sealing means are required between the ends of the vanes and the casing wall in which they rotate to prevent the air blowing the insulating material back into the hopper. The sealing means commonly used are strips of flexible material attached to the ends of the blades and extended to resiliently compress against the wall of the casing as the vanes revolve. The lives of the sealing means are relatively short due to the abrasive action of the insulating material and they need to be replaced at frequent intervals. Several radial compartments are provided so that sealing means will always be assured at all times between the compartment being filled and the one being emptied.

The principle of the present invention is a radical departure from blowing machines of the type above referred to. Under the present invention, the insulating material itself provides the air seal between the air conduit and feeder for said insulating material while the machine is in operation. Furthermore, adjusting means are provided for regulating the density of the insulating material forming the air seal or compressed mass hereinafter described and regulating the size of the granules into which the insulating material is divided. No amount of wear of the parts will impair the effective seal between the air conduit and the insulating feeder for any space between relatively moving parts of the machine are sealed by the insulating material being fed through the machine.

For a better understanding of the invention, reference may be made to the accompany drawings in which:

Fig. 1 is a plan view of a machine embodying the invention;

Fig. 2 is a front elevational view of the machine;

Fig. 3 is a detail perspective view of a picker device;

Fig. 4 is an elevational view from the right hand end of the machine;

Fig. 5 is a rear elevation of the right hand end of the machine;

Fig. 6 is an enlarged front to rear vertical section on line 6—6 of Fig. 2;

Fig. 7 is a view of another embodiment, being a rear view; and

Fig. 8 is an enlarged front to rear vertical section on line 8—8 of Fig. 7.

Referring specifically to the drawings in which like numerals are used to designate like parts, numeral 1 is a frame member composed of a base 2 and corner uprights 3 on which a hopper 4 is mounted leading to a chute 5. The base is mounted upon casters 6 so that the frame unit may be conveniently moved about.

A motor unit 7, having a pedestal 8, is bolted or otherwise attached at 9 to one end of the base and operatively connected by belt 10 to a blower device 11, also having a pedestal 12 for being bolted or otherwise attached at 13 to the base 2. Arm 14 is actuated to tighten the belt 10.

A feed device for the insulating material is bolted or otherwise fastened at 15 to the base 2 beneath the chute 5, said feed device having a screw conveyor 16 fitted to a shaft 17 which is journalled in the bottom of a casing wall 18. The casing wall extends to fit the bottom edge wall of the chute to provide a conduit leading from the hopper to the screw conveyor. The casing wall is extended to provide a discharge outlet 19 into the air conduit 20 leading from the blower to a nozzle 21 on which a hose may be fitted.

A paddle 22 may be conveniently mounted on a shaft 23 journalled in the casing wall adjacent the worm or screw conveyor on the shaft 17. The paddle, having two or more oppositely disposed fins or blades 24 and 25, is rotated to knock or feed the insulating material from the chute into the path of the worm or screw conveyor. Any positive means for impinging the insulating material into the path of the screw conveyor is satisfactory.

The end of the worm or screw terminates a substantial distance short of the air conduit 20 to provide a chamber 26 in which the insulating material will be compressed in the form of a mass 27, the length of which can be increased or decreased by moving the worm to the left or to the right on the shaft and securing it by means of the set screw 28 or other suitable means. The longer the chamber 26 is between the end of the screw conveyor and the air conduit 20, the more pressure to which the insulating material form-

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ing the slug 27 is subjected in being pushed through said chamber into the air conduit. The annular wall 29 of the chamber may be slightly tapered or constricted towards the discharge end or that end forward of the screw conveyor, thereby slightly compressing the mass of insulating material radially as it is being forced into the air conduit.

A collar 30 is positioned in the air conduit and may advantageously be adjustably mounted upon shaft 17. It is disposed in the path of the mass of insulating material as it is discharged into the air conduit. The collar is adjustable upon the shaft by set screw 31. Oppositely disposed fingers 32 are provided on the collar with their portions 33 projecting inwardly at an angle towards the mass of insulating material to engage and tear same apart into granules. Some fingers 32' without angle portions 33 may be provided. These function more to knock apart into small pieces the pieces into which the mass is divided by angle portions 33. Any number of fingers 32 may be provided and may be of any suitable design for breaking up or pulling the mass of insulating material apart. Two of these oppositely disposed fingers alone, or together with four fingers 32' have been found satisfactory, two of the fingers 32' being disposed on each side between fingers 32. The size of the granules into which the mass is broken up is regulated by adjusting the collar axially on the shaft. The farther the collar is moved to the right and away from the mass, the larger are the granules into which the mass is divided, whereas smaller granules are obtained by moving the collar to the left and towards the mass.

The mass of insulating material is always present in the chamber adjacent the air conduit since the screw conveyor is not extended through to the air conduit or near enough thereto to empty the chamber 26 in which the slug is formed. Only the screw conveyor will empty itself of insulating material when no more insulating material is fed into the machine. Thus a mass of insulating material will at all times during operation of the machine be present to provide an air seal and prevent air from the air conduit blowing into the screw conveyor chamber. The coil 34 of insulating material in the helical space between the turns of the screw conveyor fin 35 when the screw conveyor is receiving a supply of insulating material will also help, in addition to the slug, for presenting any flow of air into the screw feed chamber or the chute.

A closure plate 36 may be advantageously bolted at 37 to portion 16 of the casing in order to give access to the air chamber to permit adjustment of the collar 30. A screw fin 38 or portion, preferably reverse to the fin 35, may be attached to the shaft 17 adjacent the plate 36 to feed back into the air conduit away from the plate any insulating material that might tend to collect at the end of the shaft and against the plate. The plate is preferably recessed at 38' to permit the end of the shaft being journalled therein.

The shaft 17 and feeder supporting shaft 23 are provided with respective gear wheels 39 and 40 over which sprocket chain 41 is trained from gear 42 on shaft 43. Shaft 43 also carries gear 44 to which sprocket chain 45 connects from gear 46 on the blower device 11. Belt 10 connects the pulley 47 on the motor and another pulley 48 which is mounted on the blower shaft with gear 46.

The modification in Figs. 7 and 8 in principle is much the same as that above described, except that the fin 35' of the screw conveyor 16' does not terminate a substantial distance short of the air conduit chamber 20' but extends up to it. The air conduit chamber 20' is disposed near the bottom of the end of the screw conveyor chamber and some insulating material tends to collect in the upper end of the screw conveyor chamber beyond the screw and above the air chamber.

While the air seal obtained by the coil 34 of insulating material passing through the screw conveyor may be broken when all the insulating material has been fed out of the machine or beyond the screw fin 35', the coil of insulating material being continuously formed by continuous feeding of insulating material to the machine satisfactorily provides an air seal while the machine is in operation and before all the material is fed to the air chamber.

While I have described the machine in details of construction, it will be understood that there may be various changes without departing from the spirit of the invention.

I claim:

1. A device for handling insulating material comprising a hopper, a blow chamber, a screw conveyor between the hopper and the blow chamber for feeding insulating material from the hopper to the blow chamber, a constricted passage of substantial length between the blow chamber and the end of the screw conveyor, a picker in the blow chamber, and means for adjusting the spaced relation of the screw conveyor to the picker.

2. A device for handling fibrous insulating material comprising a hopper, a blow chamber, a screw conveyor between said hopper and blow chamber for feeding insulating material from the hopper to the blow chamber, means for radially compressing the insulating material in a compacted wadded mass as same is fed from the hopper to the blow chamber, said mass serving as an air seal between the hopper and blow chamber, rotary means in the blow chamber for breaking up the wadded mass into granules, and means for blowing the granules through the blow chamber transversely to the direction of feed of the material into said blow chamber.

3. A device for handling fibrous insulating material comprising a hopper, a blow chamber, a screw conveyor between said hopper and blow chamber for feeding insulating material from the hopper in a compacted wadded mass to the blow chamber, said mass serving as an air seal while being fed between the hopper and the blow chamber, rotary means for breaking up the compacted mass of insulating material after same has been fed into the blow chamber, and means for blowing the insulating material through the blow chamber transversely to its direction of feed of the material into said blow chamber.

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