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[54] **MORTAR APPLICATOR**

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[51] **Int. Cl.** **B28b 19/00**

[58] **Field of Search** 425/62, 63, 225, 447, 456, 425/458

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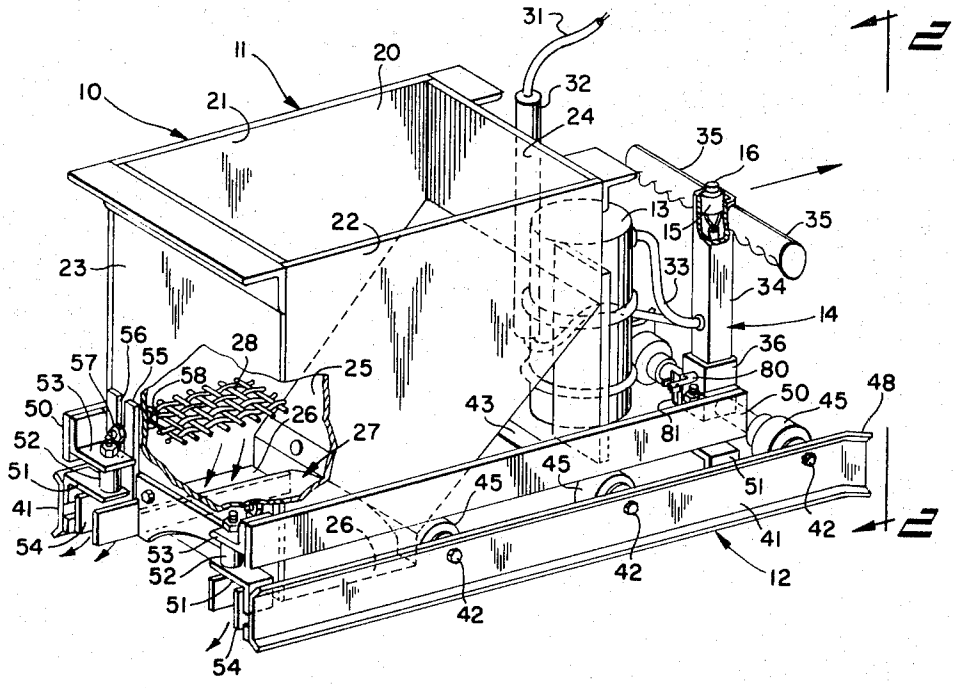
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[57] **ABSTRACT**

A portable device for applying mortar to desired portions of successive courses of block, brick, or any flat surface to improve the construction of masonry walls. The device includes a hopper, vibrator, and a base assembly having side guides for drawing the applicator along a course of block and dispensing mortar for laying the next course.

15 Claims, 7 Drawing Figures



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SHEET 1 OF 2

FIG. 1

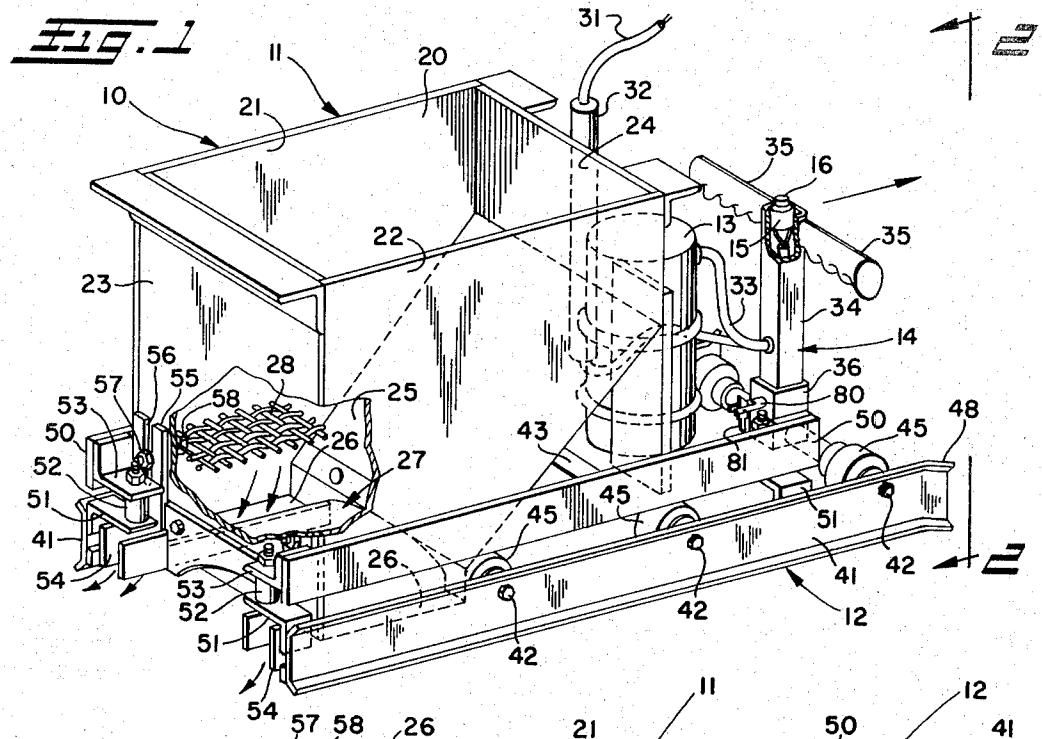
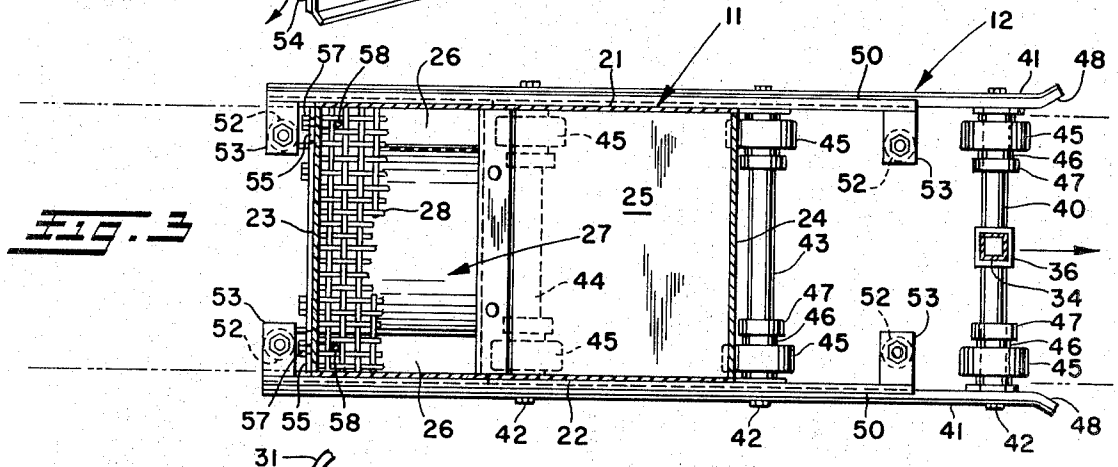


FIG. 3



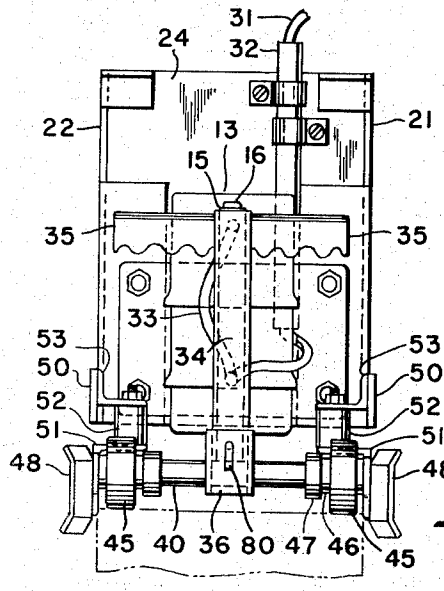


FIG. 2

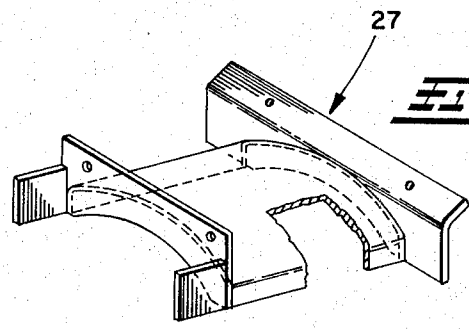


FIG. 4

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Fig. 5

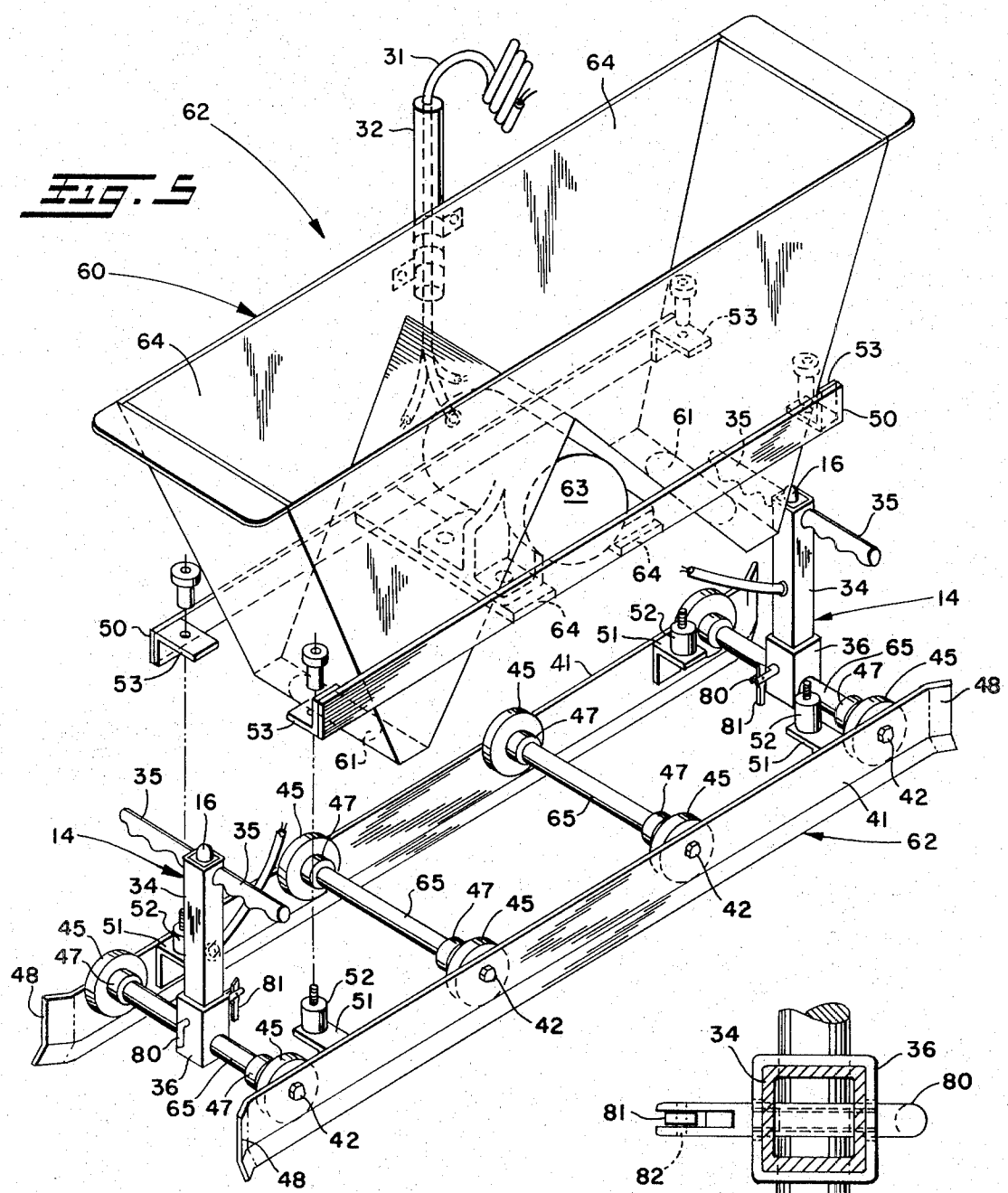


Fig. 7

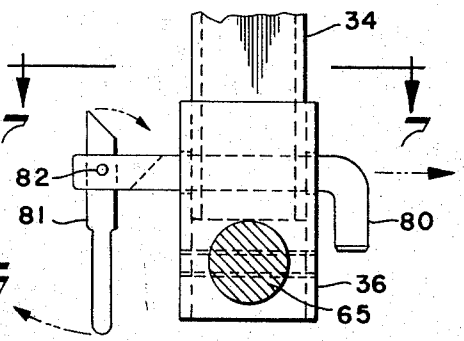


Fig. 6

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MORTAR APPLICATOR

BACKGROUND OF THE INVENTION

The subject invention is directed toward the art of mortar applicators and, more particularly, to an apparatus for applying a layer of mortar to substantially any desired surface.

The preferred embodiment of the invention is especially suited for applying strips of mortar to successive courses of brick or block to cement the next course thereto; however, as will become apparent, the invention is capable of broader application and could be used for applying or dispensing mortar into or on different surfaces or receptacles for many purposes.

At present, the application of mortar to successive courses of brick or block is generally accomplished manually by bricklayer craft. The mortar is first prepared to the proper consistency. Thereafter, the bricklayer picks up a small portion of the mortar with a hand trowel and applies it to the top surface of the previous course of brick or block. Normally, the bricklayer trowels mortar a distance of a few blocks and then lays another course of blocks on the freshly placed mortar. The blocks are carefully tapped down to ensure proper alignment and contact with the mortar. Also, the tapping acts to squeeze a portion of the mortar away to maintain a constant thickness of mortar in the joint. The surplus mortar which bulges outwardly from the joint is then scraped away with a trowel and deposited with the prepared batch of mortar for remixing and reapplication. It is generally agreed that this long existing building process is very time consuming and must be improved.

Many different types of devices for aiding in the application of the mortar have been proposed in the prior art. For example, various guides and slide hoppers have been suggested. These have been somewhat unwieldly to use and, additionally, problems have been encountered in securing uniform flow and application of the mortar. Other types of applicators including wheel mounted hoppers adapted to move along the previous course of brick have been tried. These have also been unsuccessful. Their size and weight made them difficult to handle and they often disturbed the setting and/or alignment of the previous course of blocks. Moreover, in order to assure proper mortar flow in these prior devices, complicated and difficult to clean agitator assemblies were required. The agitator assemblies could tend to further disturb the setting of the previous course of blocks.

The subject invention overcomes the above discussed problems and provides a mortar applicator which is light in weight and simple to use. Applicators formed in accordance with the preferred embodiment of the invention can rapidly apply uniform mortar ribbons of substantial length to a course of brick or block without disturbing the setting of the blocks.

BRIEF DESCRIPTION OF THE INVENTION

According to one aspect of the invention, there is provided an applicator for dispensing mortar which comprises a hopper for receiving mortar and having at least one opening through which the mortar is dispensed. Vibrating means (for example, an electrically actuated vibrator capable of producing high frequency low amplitude vibrations) is associated with the hopper for urging the flow of mortar through the hopper and the outlet opening. Base means are attached to the hopper for supporting both the hopper and the vibrating means.

Preferably, and in accordance with a more limited aspect of the invention, the hopper and the vibrating means are connected to the base means by resilient, vibration absorbing mounts. It is also contemplated that, preferably, the base means will be provided with resilient wheels to allow the applicator to be readily moved along the top surface of a course of brick or block.

The use of the vibrating means greatly facilitates the flow of mortar through the hopper and allows uniform dispensing. Additionally, the vibrator can be a completely self-contained unit connected to the exterior of the hopper so that there are no difficulties involved in cleaning the hopper. The resilient mounting means can be, for example, rubber or spring-type mounts. Their function is to prevent vibrations from being conducted through the base means to the previous course of brick or block on which the applicator is being moved. Thus, the unit of the invention will not disturb the setting of the brick or block.

In use, mortar applicators formed in accordance with a preferred embodiment of the invention can be drawn along a course of block or brick to dispense mortar a distance of as much as 25 feet or more in one application of a filled hopper. This faster operation saves valuable man hours for other important work. Further, the applicator dispenses the correct amount of mortar necessary to make a joint of the desired thickness. This eliminates waste of mortar and provides a better profit picture. Also, the requirement of "cleanout" holes at a bottom course of a wall to be concrete grouted, is unnecessary when using applicators of the type proposed, since no surplus mortar is present to bulge and drop into the internal holes of the blocks.

An additional unexpected result flowing from the subject mortar applicator is that a stronger joint is developed. The exact reason for this is not known but it is believed to be the result of applying the mortar through the use of the high frequency low amplitude vibrations. It is thought that this results in the mortar being vibrated into small openings and fissures in the brick or block. Additionally, with the use of the subject applicator, a mason can handle very high strength mortars, as well as, low strength mortars.

Accordingly, a primary object of the present invention is the provision of an improved mortar applicator.

A still further object of the invention is the provision of a mortar applicator through which the mortar is dispensed faster and more accurately than possible with prior applicators or manual application.

Yet another object is the provision of an apparatus of the general type described which includes means for controlling the quantity of mortar dispensed along a course of block or brick.

A still further object is the provision of a mortar applicator which increases the speed of laying the masonry unit by increasing the uniformity of the applied mortar.

The above and other objects and advantages will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is an isometric view of a mortar applicator formed in accordance with a preferred embodiment of the invention and having a cut-away portion showing the inside of the mortar hopper;

FIG. 2 is a rear elevational view of the mortar applicator shown in FIG. 1 (the view is taken along 2—2 of FIG. 1);

FIG. 3 is a top plan view of the mortar applicator base and the hopper distribution tray;

FIG. 4 is an isometric view of the distribution tray;

FIG. 5 is an exploded isometric view of a second embodiment of the invention;

FIG. 6 is an enlarged view of the handle disconnect arrangement; and

FIG. 7 is a cross-sectional view taken on line 7-7 of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring more particularly to the drawings wherein the showings are for the purpose of illustrating the preferred embodiments of the invention only and not for the purpose of limiting same, a first embodiment of the invention is illustrated in FIG. 1 and shows a mortar applicator **10** which broadly includes a hopper **11** supported from a base assembly **12.** A variable cycle electrical vibrator **13** is associated with the hopper **11.** A handle **14** is provided to assist in moving the applicator along a surface on which the mortar is to be applied. Additionally, a switch **15** is mounted in the center post **34** of the handle **14.** The switch **15** is a push-button type and is positioned in the top of the handle for simple thumb operation by either a right-handed or left-handed person.

The hopper **11** is preferable relatively light in weight to reduce human fatigue from using the applicator for an extended period of time. The details of construction and configuration of the hopper could, of course, vary substantially from that shown. However, in the preferred embodiment, it is shown as having a rectangular top opening **20** with parallel right and left side walls **21, 22** respectively. The side walls **21, 22** are connected perpendicular to a rear side wall **23.** A front side wall **24** extends a short distance down from the top generally parallel to the rear wall **23** and is then inclined toward the rear wall **23** as shown at **25.** The bottom of the hopper **11** is formed by a distribution tray member **27** (see FIG. **4**) which is connected to the hopper and defines a pair of spaced, parallel, outlet openings **26.** Openings **26** serve to dispense mortar from the hopper in a pair of parallel ribbons. As will become apparent hereafter, the exact shape or number of dispensing openings is not particularly important to the invention and could vary widely.

It should also be noted that a relatively heavy metal screen member **28** is removably supported within the hopper. Screen **28** rests on the upturned portion of threaded support pins **58** inside hopper **11** which extend through openings at either side of hopper rear wall **23** as shown in FIGS. **1** and **2** and also on the inclined surface **25** of front side wall **24.** The threaded portion extending outside of rear wall **23** engages an adjustment nut **57** described later. Screen **28** serves to screen out any large chunks or the like in the mortar and prevents these larger chunks from passing through the outlet openings **26.**

Although not of particular importance to the invention, the hopper is preferably formed from stainless steel and is coated with vinyl for easy cleaning.

According to one aspect of the invention, mortar flow is assured through the use of vibrating means which apply high frequency, low amplitude vibrations to the contents of the hopper to maintain a uniform flow through the outlet openings **26.** Many different types of vibrating means could be used. Additionally, they could be operatively connected to the hopper and/or its contents through many different types of support or mount arrangements. In the subject embodiment, however, a variable cycle vibrator **13** is carried from the front wall **24** of hopper **11.** Obviously, the vibrator **13** could be powered by any suitable means such as pneumatic or gasoline mortors or the like. In the preferred embodiment, however, vibrator **13** is a conventional, commercially available variable cycle electric vibrator driven by an electric motor. Power is supplied to the vibrator **13** by an electrical cord **31** which is protected at the applicator by an electrical cord mast **32** connected to the hopper and through which the cord passes. The mast **32** is, in the subject embodiment, a semi-rigid vinyl tube. The previously mentioned switch **15** is electrically connected to the vibrator through a connecting cord **33** and controls the actuation of the vibrator. As mentioned earlier, a push-button **16** of the switch **15** is located at the top of the handle center post **34** for easy access. It should be understood that by controlling the actuation of the vibrator **13,** the flow of mortar from the hopper **11** can be controlled to some degree.

Although not of particular importance to the invention, the handle **14** is of a simple "T" shape construction having grips **35** extending laterally from a center post **34** which is affixed to the forward axle **40** of the base. Forward axle **40** is connected to the base assembly side rail strips **41** by any means well known in the art such as by a threaded hole in the axle **40** and bolt as shown at **42.** A middle axle **43** and a real axle **44** are similarly attached to the side rails **41.** Wheels **45** are mounted on the axles and kept in position by thrust washers **46** and retaining collars **47.** The wheels **45** serve to permit the applicator to be easily moved along the top of a course of brick or other surface for application of the strips of mortar. It should be noted that the wheels are, in the subject embodiment, all located on one side of the outlets **26** of the hopper **11.** This allows the unit to be pulled along in the direction of the arrow as shown in FIG. **1** without having the wheels interfere with the mortar strips being applied.

Additionally, and for reasons which will subsequently be discussed, the wheels **45** are preferably formed from a relatively resilient, elastomeric material.

The preferred form for the base assembly **12** is as best shown in FIGS. **1** and **3.** As noted, it includes side rails **41** which extend along both sides of the applicator **10.** Preferably, as shown in FIG. **2,** the side rails **41** extend below the outer periphery of the wheels **45.** Additionally, they are preferably spaced apart a distance only slightly greater than the width of the brick or block on which the applicator **10** is to be used. Thus, the side rails **41** serve to perform a guide function to maintain the applicator centered on the course of brick or block. Morever, as best shown in FIG. **3,** the forward ends of the side rails **41** are preferably outwardly flared as shown at **48.** This arrangement tends to act to center

any misaligned brick or block. Note that as the unit is pulled in the direction of the arrow (FIG. 1) any block which is out of line will be cammed or guided back into alignment with the remaining blocks.

The manner in which the hopper is connected to the base assembly is relatively important. Preferably, the hopper is mounted in a manner such that the vibrations applied to the hopper or its contents by the vibrator **13** will not be conducted through to the course of brick or block on which the applicator is riding. For this reason, isolation mounting bars **50** are connected to opposite sides of the hopper and extend longitudinally of the device as shown in FIGS. **1** and **2.** Rigidly connected to side rails **41** are support angle clips **51** best shown in FIG. **1.** Similar angle clips **53** extend laterally inwardly from the isolation mounting bars **50.** Angle bars **51** and **53** are aligned and interconnected by resilient isolation mountings **52.** As can be appreciated, many different types of isolation mountings could be provided to absorb or prevent vibrations from being transmitted through to the base assembly. In the subject embodiment, the isolation mountings **52** are resilient neoprene cylinders which are bolted between the support angle clips **51** and the isolation bar angle clips **53.**

At the bottom of the hopper **11,** there are provided a pair of spaced, parallel, mortar flow control plates **54** which prevent the mortar from flowing outward from the surface to which it is being applied.

Mortar is distributed at the bottom of hopper **11** by the previously mentioned distribution tray **27** illustrated in FIG. **4.** The depth of mortar flow is also regulated so that a ribbon of substantially any desired depth can be applied. This depth regulation is accomplished by a flow control gate **55** which has slotted openings **56** to permit vertical adjustment by loosening and tightening of adjustment nut **57.**

As previously discussed, the mortar applicator **10** of the FIG. **1** embodiment is designed for distributing two parallel ribbons of mortar along the top surface of the course of block or brick or other surface. It should be appreciated, however, that by altering the bottom of hopper **11** and/or the distribution tray **27,** substantially any type of application can be made, for example, either a single ribbon or plural ribbons.

It is important to note that the FIG. **1** embodiment is arranged so that the vibrations applied to the hopper are not directed to or carried through to the surface on which the applicator is being moved. This is particularly important in the case of a course of brick or block which might be moved out of alignment if the vibrations were transmitted through to the surface. The combination of the resilient mounts and the resilient wheels has been found to eliminate substantially all vibrations from being transmitted to the surface.

FIG. **5** discloses a second embodiment of the invention which is shown used for grouting a block wall. In this embodiment, the hopper **60** has two compartments or bins **64** with openings **61.** One opening **61** is at the bottom or apex of each of the two V-shaped bottom sections. Preferably, the openings **61** are spaced at a required distance to permit mortar to flow into openings in the block, thereby grouting the block.

The hopper **60** is mounted on isolation mountings **52** similar to the mountings of the mortar applicator shown in FIG. **1.** The base assembly **62** supporting the hopper is basically similar to the mortar applicator base assembly **12** shown in FIG. **3.** One difference is that four axles **65** with wheels **45** are used with the grouter **60** as compared with three axles **40, 43, 44** and wheels **45** used for the mortar applicator **10** of FIG. **1.**

In the FIG. **5** embodiment, a vibrator **63** which is preferably the same general type of vibrator as discussed above with reference to vibrator **13** of FIG. **1,** is bolted or otherwise connected to mounting brackets **64** which are joined to isolation mounting bars **50.** Isolation mounting bars **50** are welded or otherwise positively connected to the sides of hopper **60.** It has been found that placement of the vibrator **63** between the pockets of hopper **60** provides optimum performance for this embodiment. Here again, as in FIG. **1,** power is supplied through an electric cord **31** which is protected by vinyl electrical cord mast **32** affixed to hopper **60.**

FIGS. **6** and **7** illustrate a quick-disconnect type of fastening method for attaching the handle **14** of the embodiment shown in FIGS. **1** and **5.** It will be noted that a fastening pin **80** passes through aligned openings in handle center post **34** and handle center post base **36.** At the end of pin **80** is a lever **81** which has a pivot allows the lever **81** to be aligned with the pin for removal. Thus, handle **14** may easily be removed from the base assembly along with the hopper for cleaning them separately.

The invention has been described in great detail sufficient to enable one of ordinary skill in the art of mortar applicators to make and use the same. Obviously, modifications and alterations of the preferred embodiment will occur to others upon a reading and understanding of the specification. For example, it is contemplated that although the embodiments shown are adapted for manual operation, the invention could be adapted for machine operation by supporting it to a greater machine for prefabricating building wall sections. It is my intention to include all such modifications and alterations as part of my invention insofar as they come within the scope of the appended claims.

Having thus described my invention, I claim:

1. A mortar applicator for dispensing mortar, comprising a hopper having side walls for receiving and containing mortar, said hopper having at least one opening for dispensing mortar, vibrating means integrally attached to said hopper and having a high frequency and low amplitude for urging the flow of mortar through said hopper, handle means for manually controlling said applicator and a base attached to said hopper for movingly supporting said hopper and said vibrating means therewith and vibrator dampening means for said hopper.

2. A mortar applicator as defined in claim **1** wherein said vibrating means is attached to said hopper.

3. A mortar applicator as defined in claim **1** including switch means for controlling vibrations transmitted by said vibrating means to said hopper.

4. A mortar applicator as defined in claim **1** wherein said applicator has means for dispensing mortar in at least one ribbon along a surface and has means for regulating the amount of mortar dispensed.

5. A mortor applicator as defined in claim **4** wherein said means for dispensing mortar are substantially parallel plates attached at said hopper opening for dispensing mortar in at least one ribbon along a surface.

6. A mortar applicator as defined in claim **1** wherein said base includes substantially parallel guide rail strips

for guiding the mortar applicator along a course of block.

7. A mortar applicator as defined in claim **1** wherein said hopper has two openings in the bottom for applying two ribbons of mortar therethrough.

8. A mortar applicator as defined in claim **1** wherein said base includes a plurality of wheels for advancing the mortar applicator along a wall.

9. A mortar applicator as defined in claim **1** wherein said applicator includes handle means for manually pulling said mortar applicator along a surface for dispensing mortar.

10. A mortar applicator as defined in claim **9** wherein said handle means is removeably connected to said base, said handle means having means for quickly disconnecting from said applicator base for cleaning said base.

11. A mortar applicator as defined in claim **1** wherein said hopper includes a plurality of bins with openings at the bottom for simultaneously grouting block in a wall at a plurality of positions.

12. A mortar applicator adapted to be moved along a surface for dispensing a desired thickness of mortar to the surface comprising:

hopper means having side walls for containing mortar, said hopper means including at least one outlet from which mortar is adapted to flow;

a base assembly adapted to be moved along said surface, said hopper means mounted on said base by resilient, vibration dampening mounting means;

handle means connected to said base for manually controlling said applicator; and

vibrating means having a high frequency and low amplitude and integrally connected to said hopper means for vibrating mortar in said hopper means for urging mortar flow through said outlet.

13. The mortar applicator as defined in claim **12** wherein said base assembly includes guide means for guiding said applicator along a course of block.

14. The mortar applicator as defined in claim **12** including wheel means for allowing said applicator to be easily moved along said surface.

15. The mortar applicator as defined in claim **12** wherein said hopper means includes at least one inclined lower wall and wherein said outlet is in the bottom of said hopper means.

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