

May 29, 1956

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2,747,846

GUN FOR DIRECTING PLASTIC MATERIAL AGAINST WORK

Original Filed March 17, 1953

2 Sheets-Sheet 1

FIG. 1

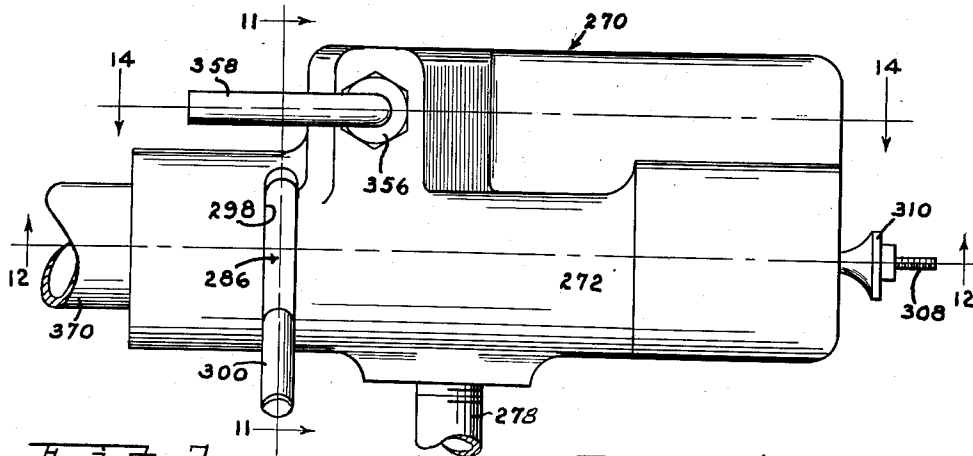


FIG. 2

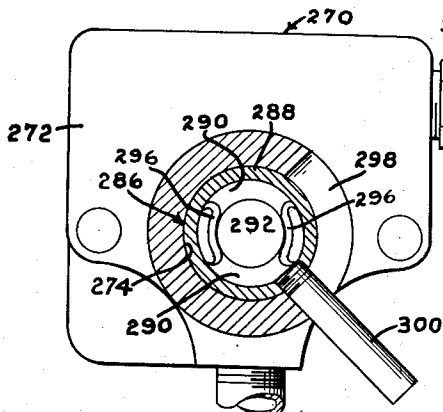


FIG. 4

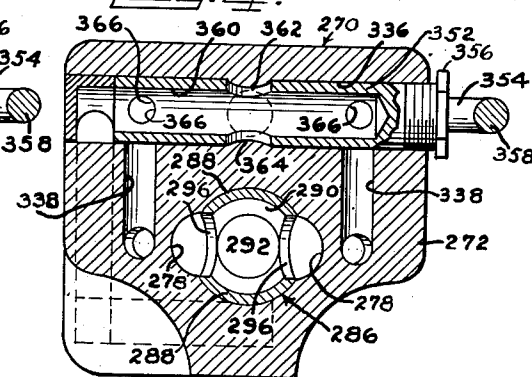
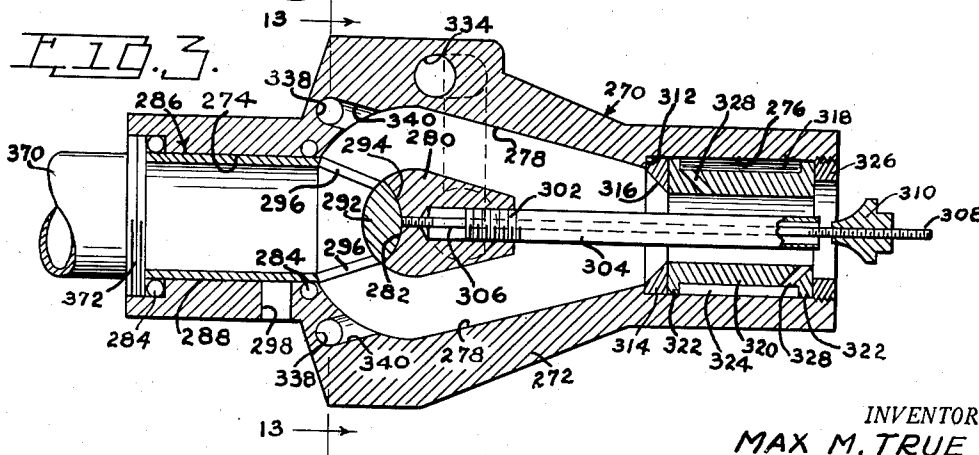


FIG. 3



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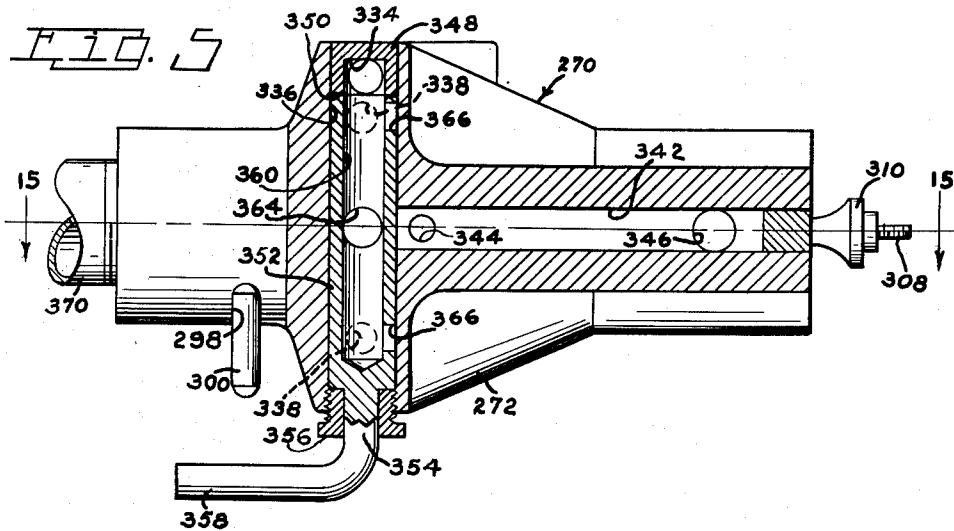
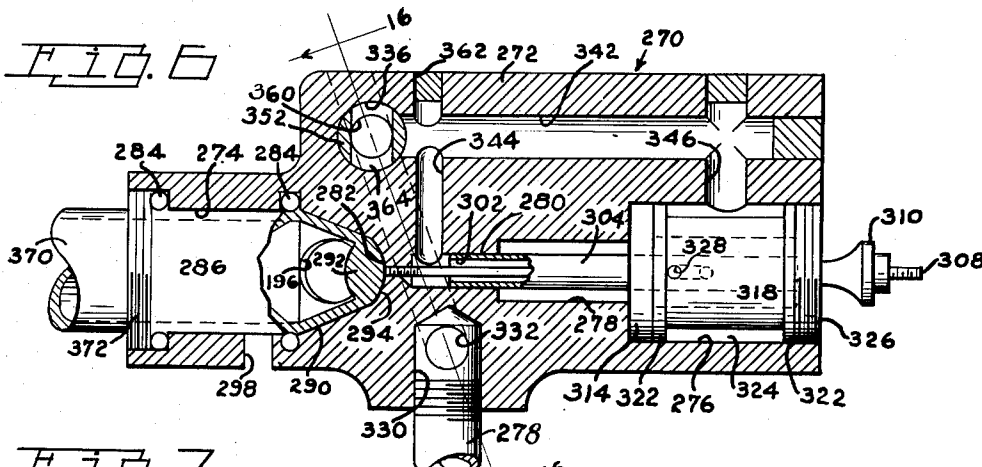
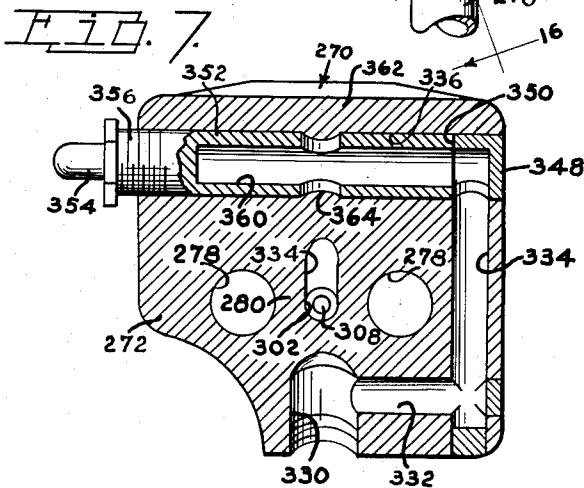
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GUN FOR DIRECTING PLASTIC MATERIAL AGAINST WORK

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Original application March 17, 1953, Serial No. 342,952.
Divided and this application October 18, 1954, Serial No. 462,947

4 Claims. (Cl. 259—151)

This invention relates to a gun for directing plasticized material against work and aerating and frothing said material to lighten it and facilitate its deposit on the work.

One object is to aerate and froth the material adjacent its point of discharge to assure homogeneity and aeration of the material immediately before its discharge.

A still further object is to assure suspension of the material in the atmosphere between the time that it leaves the gun and the time of its deposit on work.

The above and other objects may be attained by employing this invention which embodies among its features an elongated body having aligned recesses entering opposite ends and defining an aggregate inlet and an aggregate discharge passage, said body having spaced converging passages therein and establishing communication between the aligned recesses, means for regulating the flow of aggregate through the gun comprising a thimble mounted in the aggregate inlet for rotation about the longitudinal axis thereof, said thimble having ports extending therethrough adjacent the inner end of the inlet recess for registration with the divergent ends of the converging passages, and means carried by the thimble and extending radially outwardly therefrom and through the wall of the inlet recess for rotating the thimble and moving the ports into and out of registration with the passages.

Other features include a hollow conical extension carried by the thimble and projecting longitudinally therefrom, an end wall closing the end of the conical extension remote from the thimble, said conical extension having diametrically opposed ports extending there-through for registration with the passages when the thimble is rotated to a selected position about its longitudinal axis, and means carried by the thimble and extending through the body for rotating the thimble and moving the ports into and out of registration with the passages when the thimble is rotated to a selected position about its longitudinal axis, and means carried by the thimble and extending through the body for rotating the thimble and moving the ports into and out of registration with the passages.

Still other features include a semi-spherical end on the conical extension adapted to fit into a semi-spherical socket carried by the body between the divergent ends of the passages.

This application is a division of my co-pending application Serial No. 342,952 filed March 17, 1953.

In the drawings:

Figure 1 is a side view in elevation of a gun used for distributing the plasticized material.

Figure 2 is a vertical sectional view taken substantially on line 11—11 of Figure 1.

Figure 3 is a horizontal sectional view taken substantially on the line 12—12 of Figure 1.

Figure 4 is a vertical sectional view taken substantially on line 13—13 of Figure 3.

Figure 5 is a horizontal sectional view taken substantially on line 14—14 of Figure 1.

Figure 6 is a vertical sectional view taken substantially on line 15—15 of Figure 5, and

Figure 7 is a sectional view taken substantially on line 16—16 of Figure 6.

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A gun is designated generally 270 comprising an elongated body 272 having aligned openings 274 and 276 entering opposite ends and forming respectively inlet and discharge passages for the plasticized material being distributed. Establishing communication between the aligned openings 274 and 276 are convergent passages 278 which converge as they approach the discharge passage 276 and are separated adjacent the inlet passage 274 by a post 280 having a concave spherical recess 282 therein which faces and aligns axially with opening 274. As shown in Figure 3 the divergent ends of the passages 278 curve inwardly about the post 280 and merge with the opening and fitted in the body 272 adjacent opposite ends of the opening 274 are anti-friction bearings 284 in which is mounted for rotation a valve thimble designated generally 286.

The valve thimble 286 above referred to comprises a tubular body 288 carrying at one end a hollow conical extension 290 which terminates at its smaller end in a head 292 having a convex spherical surface 294 which seats in the concave recess 282 and cooperates therewith in maintaining the thimble 286 in proper position in the body 272 while at the same time permitting the thimble to rotate about its longitudinal axis. Extending through the conical extension between the body 288 and head 292 are diametrically opposite ports 296 which in one position of the thimble establish communication between the passage 274 and the passages 278 but in another position arrest such communication. Opening through the side of the body 272 and communicating with the opening passage 274 is a slot 298 through which projects a control handle 300 which is carried by the thimble 286 and by which the thimble is rotated to move the ports 296 into and out of registration with the passages 278.

Entering the post 280 opposite the recess 282 is a bore 302 which is internally screw threaded to threadedly receive an air tube 304 which extends axially from said bore 302 through the opening 276 in concentric spaced relation therewith. A rod 306 is carried by the post 280 and extends axially through the air tube 304 and beyond the end of the body 272 adjacent the opening 276. The rod 306 is threaded as at 308 adjacent the end thereof remote from the post for threaded engagement with a substantially conical spreader 310 by which is controlled the pattern of a stream of aggregate issuing from the gun.

Bearing against a shoulder 312 formed in the body 272 at the junction of the opening 276 and passages 278 is an aggregate condensing ring 314 having a conical passage 316 extending therethrough in concentric spaced relation to the air tube 304. Seated in the opening 276 against the condensing ring 314 is an aggregate discharge nozzle designated generally 318 and comprising a tubular body 320 carrying adjacent opposite ends outwardly extending annular flanges 322 which support the body 320 in spaced relation to the wall of the opening 276 to define therewith around the body 320 an annular air chamber 324. An externally screw threaded retaining ring 326 threadedly engages the wall of the opening 276 adjacent the end thereof remote from the condensing ring 314 and bears on the nozzle 318 to hold it in place. Extending through the body 320 at spaced intervals are inclined air discharge passages 328 having therein inner discharge ends directed toward the discharge end of the gun while their outer ends communicate with the chamber 324.

Opening through the bottom of the body 272 and extending thereinto below the passages 278 is a recess 330 into which is threaded an air pressure supply fitting which is connected in any suitable manner with a source (not shown) of air pressure. Extending transversely in the

body 272 and communicating with the recess 330 is an air passage 332 which opens into an upwardly extending passage 334 which opens into a bore 336 adjacent one end thereof. The bore 336 extends transversely through the body 272 above the passages 278 and communicates adjacent opposite ends with air discharge passages 338 which extend downwardly within the body 278 adjacent opposite sides thereof and terminate in ports 340 which open axially into the passages 278 so that air jets issuing through said ports will penetrate the core of the aggregate passing through the passages to aerate and homogenize the aggregate.

Extending longitudinally within the body 272 above the passages 278 is an air duct 342 which opens at one end into the bore 336 midway between opposite ends thereof and perpendicular to the passages 338. A duct 344 is formed in the body 272 adjacent the base 336 and communicates at one end with the bore 302 in port 280 adjacent its opposite end with the duct 342. A parallel duct 346 establishes communication between the duct 342 and the chamber 324 so that when air is supplied to the duct 342 it will be projected through the air tube 304 and the air discharge passages 328.

The end of the bore 336 adjacent the air passage 334 is closed by a thimble 348 which forms an annular abutment 350 against which bears one end of an elongated turning plug 352 carrying at one end a stem 354. This turning plug fits snugly within the bore 336 and surrounding the stem 354 and threadedly engaging the bore 336 adjacent the end thereof remote from the thimble 348 is a conventional packing gland 356. A handle 358 is carried by the stem 354 by which the plug 352 may be turned to various positions within the bore 336. Opening through the end of the turning plug 352 remote from the stem 354 is a bore 360 and extending through the turning plug 352 substantially midway between opposite ends of the bore are aligned ports 362 and 364 which are adapted to register with the passage or duct 342. Extending through the turning plug 352 adjacent opposite ends of the bore 360 are ports 366 which in one position of the plug 352 register with the passage 338. The axes of the ports 366 lie in a common plane which intersects the axis of the turning plug 352 in perpendicular relation to the axes of the ports 362 and 364. It will thus be seen that when the port 364 registers with the duct 342 the ports 366 will register with the passages 338 and the air will be distributed throughout the entire system. However when the port 364 registers with duct 342 no air will enter the passages 338 though full air pressure will be delivered to that portion of the gun in front of the passages 238.

With the gun 270 connected by a suitable flexible conduit 370 to a suitable source of plasticized aggregate which is forced under pressure through the conduit to the gun, the mixed aggregate will enter the gun through the thimble 286, and with the air tubes 276 connected to a course of air under pressure, air will enter the chamber 330 and fill the passages 332, 334 and 360 with air under pressure. Upon manipulating the handle 300, the thimble 288 may be rotated about its axis in the recess 274 to bring the ports 296 into registration with the passages 278 so that the aggregate will be forced therethrough and into the discharge barrel 318 from which it is discharged toward the work. Upon rotating the turning plug 352, the ports 366 may be brought into register with the passages 338 to direct air jets into the cores of the streams of aggregate passing through the passages 278 to homogenize and aerate the aggregate. Simultaneously with the bringing of the ports 366 into register with the passages 338 the port 362 in the turning plug 352 will register with the duct 342 so that air will pass through the passage 334 and air tube 304 to project the aggregate onto the work. By reason of the entrance of the air into the duct 342 air will enter the chamber 324 through the passage 346 and will project

through the inclined passages 328 in the nozzle 318 to impinge in the aerated and homogenized material and propel it through said nozzle. The pattern of the stream of aggregate propelled through the nozzle and projected by the air issuing from the air tube 304 is regulated by turning the conical spreader 310 and adjusting its position lengthwise on the rod 303. When the coating operation has been completed, the gun 270 and tube 370 may be cleared of plasticized material by discontinuing the flow of air into the mixing tank from which delivery has been made and rotating the turning plug to bring the port 364 into register with the duct passage 342 and closing the discharge end of the gun to build a back pressure in the passages 278 and the thimble 288.

What is claimed is:

1. A gun for directing against work an adhesive plasticized aggregate, said gun comprising an elongated body having aligned recesses entering opposite ends and defining aggregate inlet and aggregate discharge passages, said body having spaced converging passages extending therein and establishing communication between the aligned recesses, an air tube carried by the body and projecting axially through the aggregate discharge passage, said body having an air chamber therein for receiving air under pressure, said body also having an air duct therein in which communicates with the chamber and the air tube, and valve means in said body and interposed in the air duct between the chamber and the tube for regulating the flow of air through the air tube.

2. A gun for directing against work an adhesive plasticized aggregate, said gun comprising an elongated body having aligned recess entering opposite ends and defining aggregate discharge passages, said body having spaced converging passages extending therein and establishing communication between the aligned recesses, an elongated tubular body having outwardly extending annular flanges fitted in the recesses defining the aggregate discharge passage and cooperating with the walls of the recess in defining an annular air chamber, and tubular body having angularly disposed air discharge passages extending therethrough for directing air jets against aggregate entering said tubular body and propelling said aggregate through said body, and ducts within the gun body and communicating with the chamber for delivering air under pressure to the chamber.

3. In a gun for directing an adhesive plasticized material against work, an elongated body having aligned recesses opening through opposite ends and spaced passages establishing communication between said recesses, means for aerating and homogenizing plasticized material entering the gun and propelling it through the passages, said means comprising an air tube carried by the body and extending axially through one of the recesses, said body having ports opening into the passages in axial alignment therewith, said body having an air chamber therein and a bore extending transversely therethrough above the passages, said body having air ducts therein which establish communication between the air chamber and the bore and other air ducts therein which establish communication between the bore and the ports, a turning plug mounted in the bore for rotation therein, and said turning plug having ports extending therethrough which establish communication between the bore and the other air ducts.

4. The structure defined in claim 3 in which the body has still other air ducts which establish communication between the bore and the air tube, and the turning plug has diametrically opposed parts extending therethrough for establishing communication between the bore and the still other ducts.

References Cited in the file of this patent

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