

March 6, 1962

R. E. SCHLEMMER

3,023,967

MACHINE FOR PROJECTING FIBERS

Filed Jan. 30, 1961

4 Sheets-Sheet 1

FIG. 2

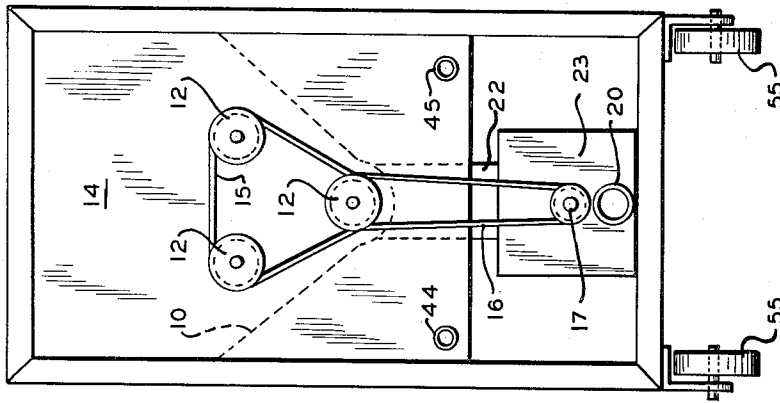
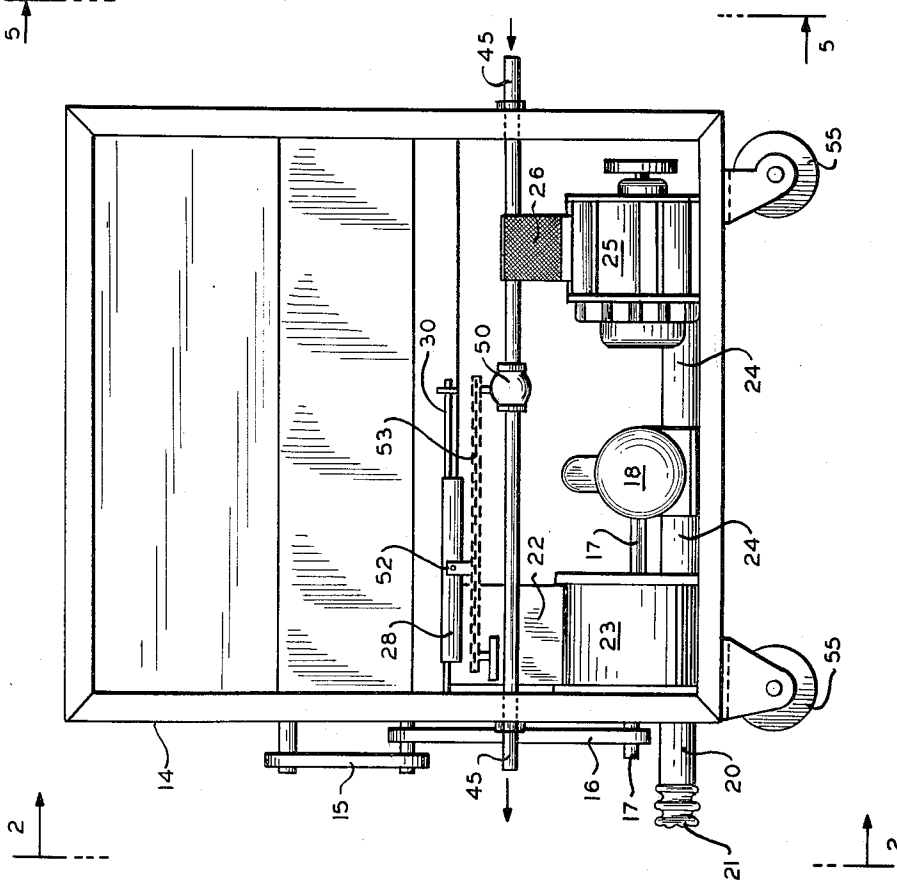


FIG. 1



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FIG. 4

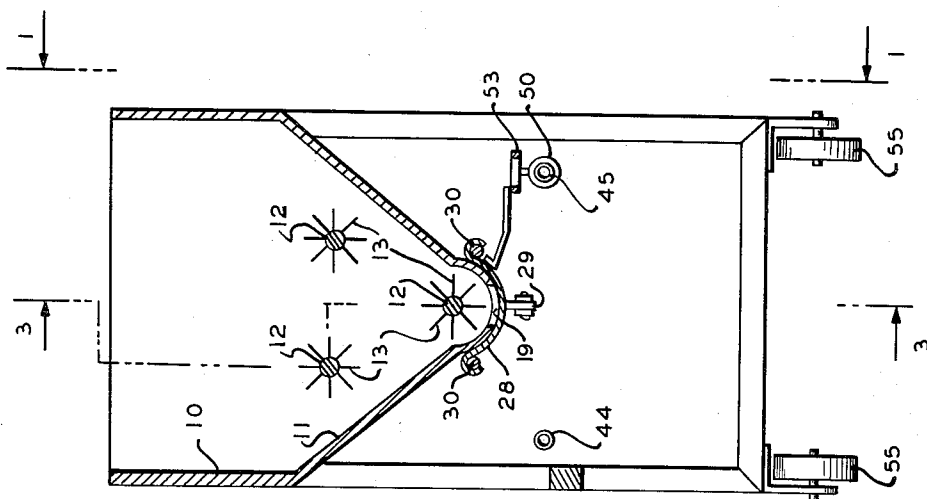
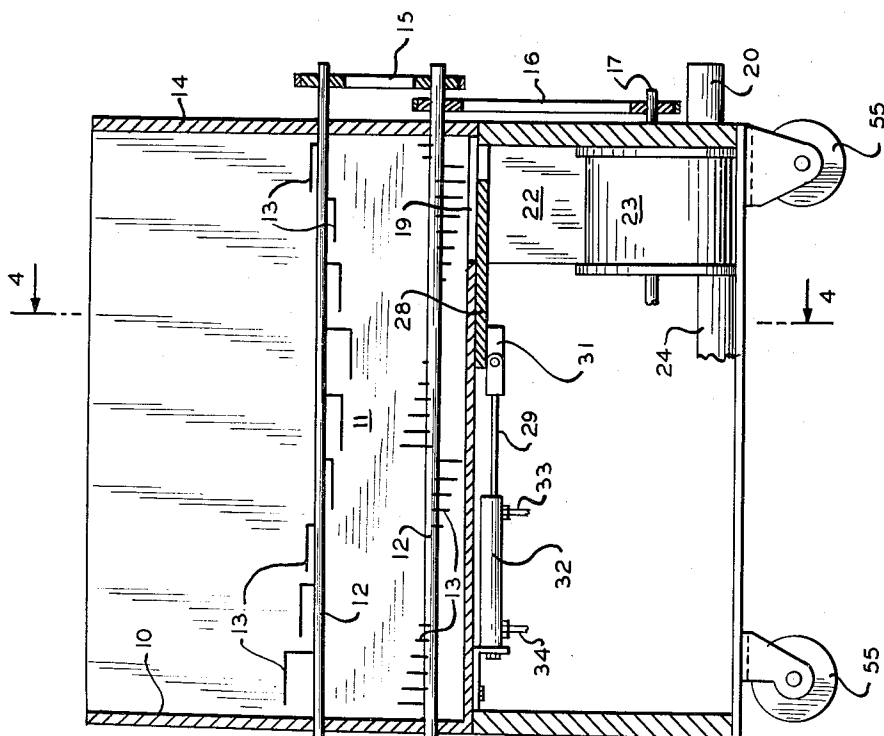


FIG. 3



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FIG. 5

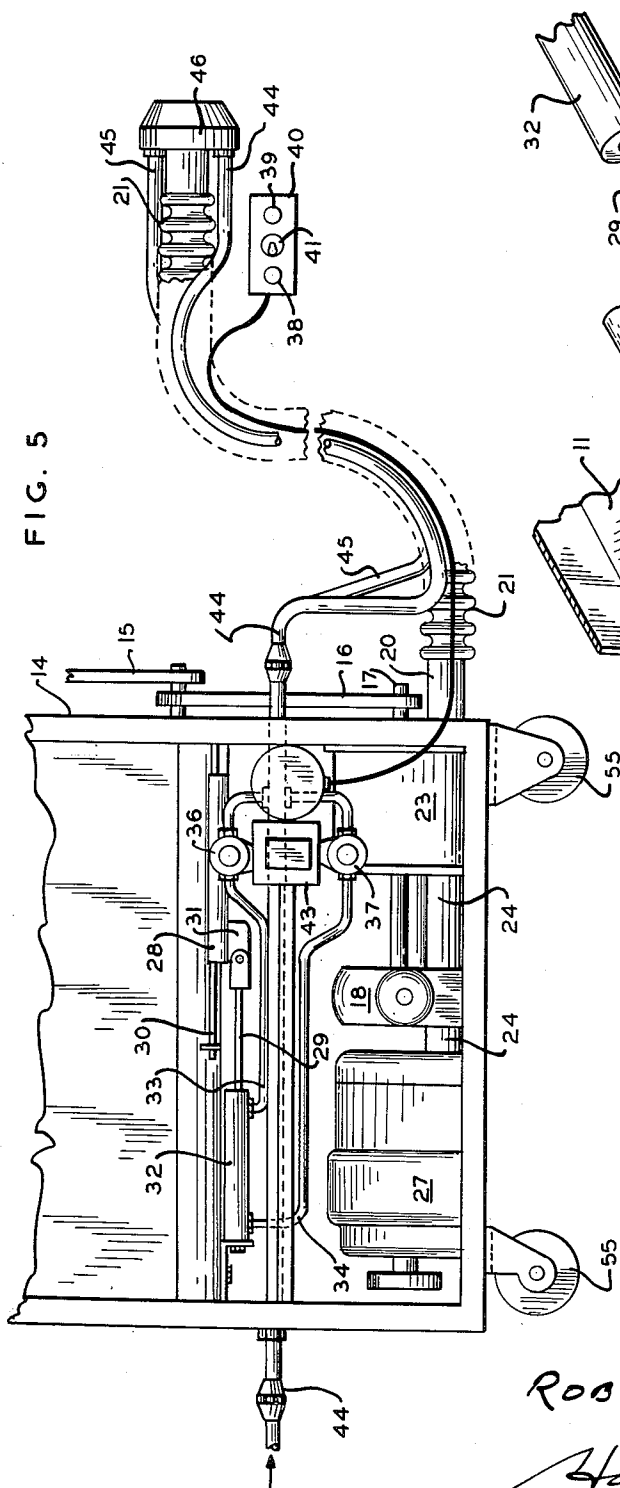
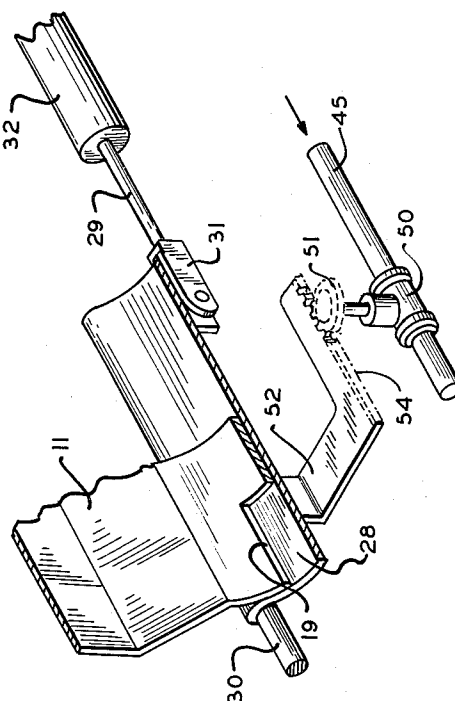


FIG. 6



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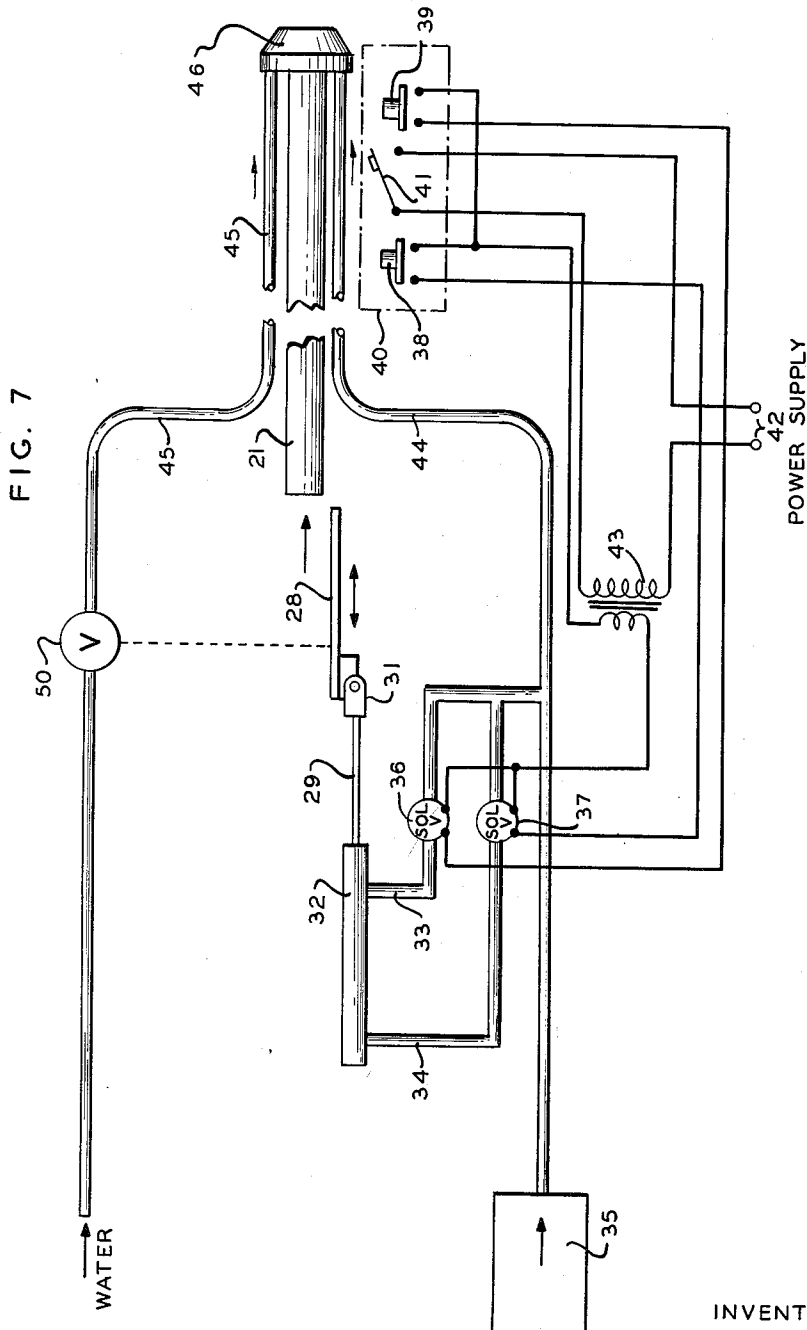
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3,023,967

MACHINE FOR PROJECTING FIBERS

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4 Claims. (Cl. 239—61)

This invention relates to a novel machine for and method of projecting a stream of fibers onto a surface to be coated thereby, with particular reference (without limitation thereto) to projection of insulating and acoustic fibers.

The invention provides for synchronization of fiber and moistening liquid flow and mixture automatically during the entire operation of the machine, avoiding the errors the operator otherwise would make in having too small or too high a rate of moistening liquid to suit the quantity flow of fiber. Thus uniformity is attained, obviating the nonuniformity and damage resulting in practice from over or under moistening of fibers. The objectives above mentioned are attained in a novel and automatic manner by the improved machine and method of the invention, involving novel procedures which have been proven to be highly successful in practical operation.

An object of this invention is to moisten fibers so applied at an automatically adjusted, predetermined ratio of moistening fluid to fiber, maintained constant without reliance on or action by the operator, under variations in volume of flow of fiber encountered in practice.

The drawings, illustrating procedures and devices useful in carrying out the invention, and the description below, are exemplary only of the invention, which shall be deemed to cover all other devices and procedures coming within the scope and purview of the appended claims.

In the drawings, wherein similar reference characteristics indicate like parts:

FIG. 1 is a partly sectional side elevational view of a machine embodying the invention,

FIG. 2 is an end elevational view thereof, taken at line 2—2 of FIG. 1,

FIG. 3 is a fragmentary elevational sectional view thereof, taken at line 3—3 of FIG. 4,

FIG. 4 is a vertical sectional view thereof, taken at line 4—4 of FIG. 3,

FIG. 5 is a side elevational view thereof, taken at line 5—5 of FIG. 2,

FIG. 6 is a fragmentary perspective view of parts thereof, and

FIG. 7 is a schematic view of a form of the invention.

As shown in the drawings, the novel machine of this invention includes a casing 10 which may be formed with the lower wall 11 thereof (FIG. 4) of V outline or otherwise formed and with agitators 12 with blades 13 thereon inclined toward the discharge end 14 (FIG. 1) of the casing. The agitators 12 may be of such number as may be desired (three sets being shown by way of example) and may be driven by suitable means such as FIG. 2 by a chain 15 entrained over pulleys fixed to the ends of the agitators and in turn driven by suitable means such as a chain 16 driven by shaft 17 of (FIG. 1) motor 18. The blades 13 are preferably so directed as to move fiber deposited into the casing 10 toward the end 14 of the machine adjacent which the casing is provided with a discharge aperture 19 through which the fiber is fed to the discharge hose 20 (FIG. 3) having flexible pipe 21 (FIG. 1) connected thereto. Intermediate the discharge aperture 19 of casing 10 and the flexible pipe 21 the fiber may pass through a connecting chamber 22 (FIGS.

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2 and 3) and metering device 23. The latter may be such as shown at 16 in FIG. 2 of Stumpf, Patent No. 2,890,079, or may be of any other type designed for metering the fiber into the discharge hose 20 and out of said hose under pressure of the compressed air line 24 connected to a suitable source such as compressor 25 (FIG. 1) having suitable parts such as an air intake filter 26 and an actuating motor 27 (FIG. 5).

The aperture 19 of the casing 10 (FIGS. 6, 4, 3) may be closed to the controlled degree desired by moving a plate 28 (which may be mounted in slidably arranged underlying relation to the lower wall 11 of casing 10, on rails 30). To that end, a rod 29 is fixed at one end 31, to the plate 28 and at the other end to power operating means 32 which may, for example, be a reversible solenoid or an air or liquid cylinder or other actuator, having lines 33, 34 (FIGS. 3 and 7) connecting the power member 32 with a fluid or compressed air source 35 (FIG. 7) for example, through suitable solenoid or other control means or valves 36, 37 for thus controlling the direction of movement of rod 29 and thus the degree to which the aperture 19 is uncovered by plate 28 and thus the quantity flow of fiber through the casing and into the discharge pipe 21. The solenoid or other valves 36, 37 may in turn be actuated by switches 38, 39 (FIG. 7) which may be controlled by the operator so as to move the plate 28 in the desired direction to precisely the desired extent to thus precisely control the area of aperture 19 left uncovered or open and thus the quantity flow of fiber through the machine. The switches 38, 39 may be incorporated in a panel 40 (FIG. 5) fixed to the flexible hose 21 adjacent its discharge end in any convenient manner, or at any other point for ease of operation, and a power line switch 41 may be incorporated (FIGS. 5 and 7) in said panel for connection of the source of power 42 (FIG. 7) through switch 41 and transformer 43 to the solenoids 36, 37. Compressed air and liquid lines 44, 45 (FIGS. 1, 2 and 5) may be connected with compressor 27 or other source and with a liquid source at one end and at the opposite end with a hollow ring or nozzle 46 (FIGS. 7 and 5) through which the end of the flexible hose 21 passes and to which said hose is secured in any suitable manner, said air and water lines 44, 45 opening into the interior thereof in a manner well known in this art so as to eject the liquid under pressure through suitable apertures at the front of nozzle 46. The thus projected liquid will flow into the nozzle 46 and be projected therefrom to mingle with the stream of fibers and moisten the same to precisely the degree required by the quantity flow of the material through the discharge hose 21 as predetermined by the aperture 19 control means above described.

Pursuant to the invention, novel means are provided for automatically precisely synchronizing the quantity flow of liquid to the quantity flow of fiber through the apparatus. Such automatic synchronism is attained as follows: A valve 50 is placed in the liquid line 45 (FIGS. 7, 1, 6) and a pinion or sprocket 51 (FIG. 6) fixed to the valve stem is connected with the aperture closing plate 28 as by a bracket 52 which in turn may be fixed to a link of chain 53 entrained over the sprocket 51; said bracket may have secured thereto or (FIG. 6) formed integral therewith a rack 54 in mesh with pinion 51. Thus, movement of the plate 28 by the operator's actuation of switches 38 or 39 will not only move plate 28 and thus control the area of opening 19 and thus the quantity flow of fibers through the machine but also, simultaneously and automatically, control the quantity flow of liquid through the pipe 45 and out of the nozzle 46. The apparatus may be provided with wheels (55, FIG. 5) to facilitate moving the same.

Without further elaboration, the foregoing explains the invention so that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

The invention is not limited to the specific constructions as illustrated and described, as the same is only illustrative of the principles involved which are capable of extended application in various forms, and the invention comprehends all construction within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a fiber projecting machine for mixing a stream of fibers and a stream of moistening liquid and for varying the quantity flow of the stream of fibers and simultaneously and automatically controlling the quantity flow of the stream of moistening liquid, the improvement comprising a fiber containing casing having an outlet port at its lower end for discharging therefrom a stream of fibers, a plate-like valve slidably positioned adjacent said outlet port for movement into and out of closing registry therewith, power means operatively connected to the plate-like valve for moving the same relative to the outlet port whereby the quantity flow of the stream of fibers from the casing can be selectively adjusted, means connected to the outlet port at the lower end of said casing for conveying the stream of fibers from the casing to a surface to be coated, said means including a flexible pipe having at its free end a projection nozzle for directing and discharging a stream of fibers, means for supplying a stream of moistening liquid for moistening the stream of fibers including a liquid carrying conduit adapted to be connected at one end to a liquid source and having its opposite end in fluid communication with said projection nozzle whereby the moistening liquid and the stream of fibers are comingled as they pass through said projection nozzle, an adjusting valve in said liquid carrying conduit for controlling the quantity flow of the stream of moistening liquid admitted to said projection nozzle, and coupling means directly interconnecting said plate-like valve and

said adjustable valve in said liquid carrying conduit, actuation of the power means to move the plate-like valve and adjust the quantity flow of the stream of fibers issuing from the casing being effective through said coupling means to simultaneously move the adjusting valve in the liquid carrying conduit in direct ratio to the degree of movement of the plate-like valve and automatically adjust the quantity flow of the stream of moistening liquid to thereby maintain a preselected ratio between the quantity flow of the fibers and the quantity flow of the moistening liquid to assure uniformity of moistening of the stream of fibers.

2. In a fiber projecting machine as set forth in claim 1, said adjusting valve including an actuating stem and a pinion fixed to said actuating stem, said coupling means directly interconnecting said plate-like valve and said adjusting valve comprising a chain entrained over said pinion on said actuating stem and being operatively connected to said plate-like valve.

3. In a fiber projecting machine as set forth in claim 1, said adjusting valve including an actuating stem and a pinion fixed to said actuating stem, said coupling means directly interconnecting said plate-like valve and said adjusting valve comprising a toothed rack fixed to said plate-like valve with the teeth thereof in mesh with said pinion on said actuating stem.

4. In a fiber projecting machine as set forth in claim 1, said power means comprising a rod fixed at one end to the plate-like valve and actuating means connected to the other end of said rod to reciprocate the rod to thus move the plate-like valve relative to the outlet port, and switch means controlling said actuating means to thus control the movement of the plate-like valve relative to said outlet port.

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