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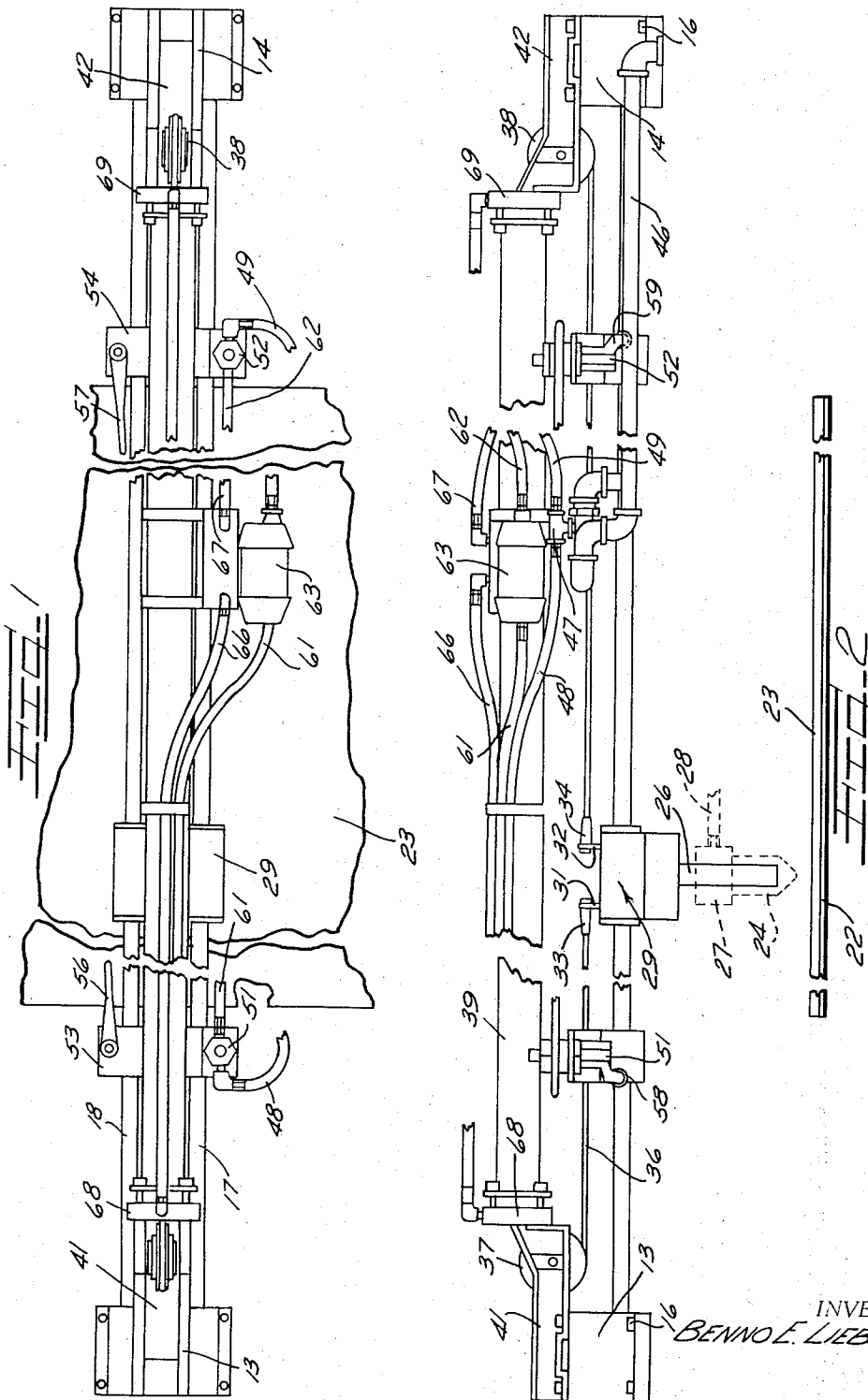
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3,358,646

RECIPROCATING CARRIAGE FOR SPRAYING MEANS

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3 Sheets-Sheet 1



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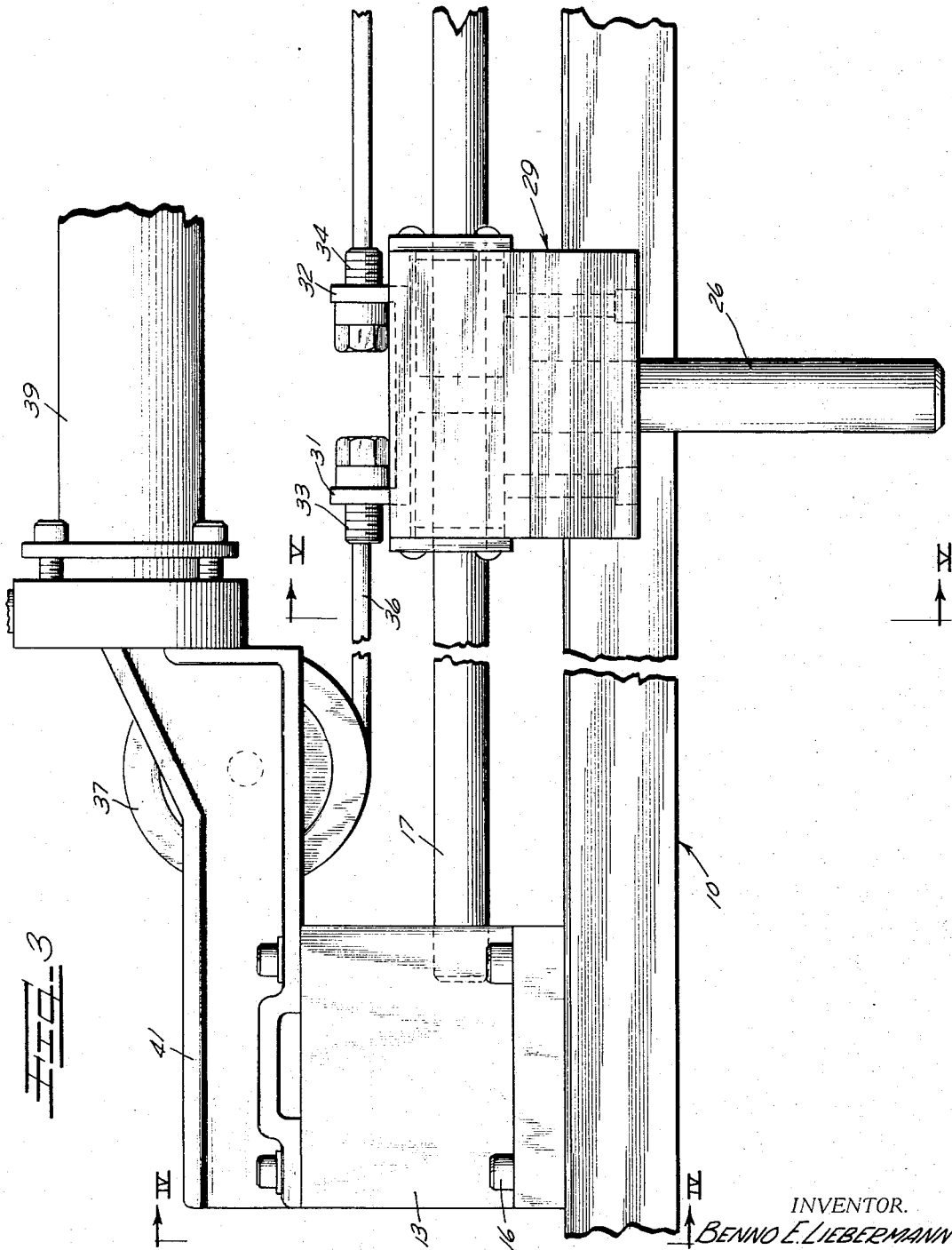


FIG. 3

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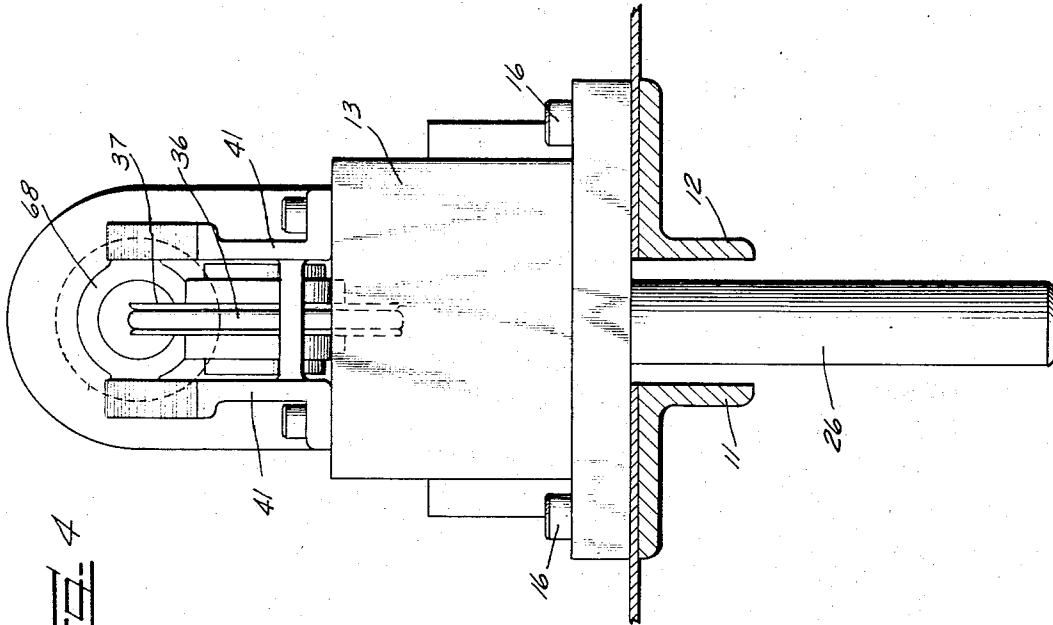
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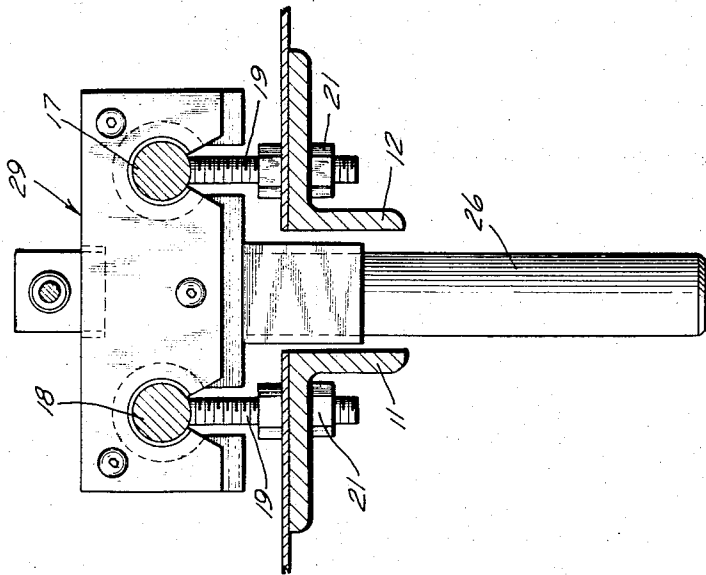
RECIPROCATING CARRIAGE FOR SPRAYING MEANS

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3 Sheets-Sheet 3



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RECIPROCATING CARRIAGE FOR SPRAYING MEANS

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2 Claims. (Cl. 118—323)

ABSTRACT OF THE DISCLOSURE

Apparatus for applying a liquid spray to a moving porous web including a spray means reciprocable transversely to the direction of movement of the web, a pneumatic system coupled to said spray head for reciprocating the same, adjustable limit means for determining the extent of reciprocation of the spray means, and pneumatic means interconnecting the limit means with the pneumatic system.

The present invention relates to an improved apparatus for moving continuously a spray gun or guns for the purpose of coating or spraying continuously transverse moving webs, papers, textiles, or any other material, or components at various speeds.

Heretofore, some equipment has been designed for the purpose of continuously spraying a moving web by means of spray heads which were normally mounted on a chain extending between a pair of spaced sprockets. This type of system has proven to be not completely satisfactory in use because first, it was difficult to adjust the length of travel of the spray means to compensate for different web widths, since this involved relocating one of the sprockets and changing the length of the chain. Second, the spray means, in being carried on the chain about the sprockets was subjected to a substantial amount of stress, particularly at the peripheries of the sprockets, with the result that the speed of traverse was severely limited.

The present invention provides a spraying unit for coating travelling continuous webs which can be conveniently adjusted to accommodate webs of varying widths. The apparatus of the present invention is also designed for considerably higher speed operation than was heretofore possible with spraying devices of this type.

One of the objects of the present invention is to provide an improved apparatus for continuously spraying a travelling moving web more rapidly than has heretofore been considered possible in practice.

Another object of the invention is to provide an adjustable reciprocating carriage assembly for spraying devices which can be readily adjusted to compensate for different lengths and speeds of stroke of the spraying device, to accommodate different widths and traveling speeds of webs.

Another object of the invention is to provide a spraying assembly which subjects the spraying head itself to considerably less mechanical stress than comparable installations of the past.

A further object of the invention is to provide an automatic spraying device which presents fewer maintenance problems than devices used for the same purpose previously.

In accordance with the present invention, I provide an apparatus particularly useful for impregnating a moving web with an adhesive binder which includes a conveyor means for supporting a web for travel along a predetermined plane, and guide means extending transversely to the path of movement of the conveyor and spaced therefrom, together with spray means mounted for reciprocation along the guide means, and means for sup-

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plying the spray means with adhesive binder composition for application to the web carried by the conveyor means. Adjustable limit means are provided along the guide means for controlling the length of the reciprocating stroke of the spray means, these limit means normally comprising valves which control the operation of a pneumatic control system which reciprocates and varies the required speed of the carriage upon which the spray head is mounted.

A further description of the present invention will be made in conjunction with the attached sheets of drawings which illustrate a preferred embodiment thereof.

In the drawings:

FIGURE 1 is a plan view of a reciprocating spray apparatus embodying the improvements of the present invention;

FIGURE 2 is a view in elevation of the system shown in FIGURE 1;

FIGURE 3 is a fragmentary view in elevation of a portion of the assembly;

FIGURE 4 is a view taken substantially along the line IV—IV of FIGURE 3; and

FIGURE 5 is a cross-sectional view taken substantially along the line V—V of FIGURE 3.

As shown in the drawings:

In FIGURE 1, reference numeral 10 indicates generally a frame structure composed of a pair of opposed angle irons 11 and 12 (FIGURES 4 and 5). A pair of upstanding support members 13 and 14 are secured to the angle irons 11 and 12 by means of bolts 16. Extending between the supports 13 and 14 is a pair of circular rods 17 and 18 which serve as guide means for the reciprocating carriage. The rods 17 and 18 are also secured to the angle irons 11 and 12 by means of threaded studs 19 and their associated nuts 21 (FIGURE 5).

The support structure thus far described is mounted transversely with respect to a conveyor belt 22 which, for purposes of illustration, is shown as carrying a non-woven web mat 23 thereon. The web 23 is arranged to be sprayed from a spray nozzle 24 which is clamped to a depending pipe 26 by means of a clamping fixture 27. A flexible conduit 28 delivers the liquid to be sprayed through the nozzle 24 thereto, under suitable pressure.

The spray nozzle support 26 is carried by a carriage 29 which is slidably mounted along the rods 17 and 18 as best seen in FIGURE 5 of the drawings, with the support 26 extending between the opposed flange portions of the angle irons 11 and 12. The carriage 29 has a pair of brackets 31 and 32 thereon to which are secured ends 33 and 34 of a cable 36. The cable 36 runs around a pulley 37 at one end of the support, and a pulley 38 at the opposite end. The cable 36 is connected to a piston (not shown) contained within a cylinder 39 connected to the supports 13 and 14 by means of support brackets 41 and 42 respectively. Movement of the piston within the cylinder 39 and, consequently, movement of the cable 36 is under the control of a pneumatic control system which is fed from a pressurized source of air by means of a conduit 46. The air is directed to a T joint 47 and is then directed by means of hoses 48 and 49 through a pair of oppositely disposed limit switches 51 and 52. The limit switches 51 and 52 are mounted on supports 53 and 54 which are readily slidable along the rods 17 and 18, and clamped in adjusted position thereon by means of locking cams 56 and 57 respectively. Each limit switch includes a pivoted roller 58 and 59 which is arranged to engage the carriage 29 at the limit of the travel of the carriage, and thereby opens to introduce the pressurized air through conduits 61 and 62 respectively into a control cylinder 63. Within the control cylinder 63, there is a reciprocable piston which, when actuated by the air pressure applied at one or the other side thereof serves to de-

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liver the pressurized air by means of conduits 66 and 67 to pressure chambers 68 and 69 disposed on opposite sides of the cylinder 39.

The operation of the assembly should be evident from the foregoing description. As the web 23 is carried by the conveyor belt 22, the carriage 29 is pulled by means of the cable 36 until such time as the carriage 29 strikes one of the limit switches, for example, the roller 58 on the limit switch 51. At this time, the switch is opened and compressed air is thereupon introduced into the control cylinder 63 and is ultimately directed through the hose 67 into the air chamber 69 at the right side of the cylinder assembly 39. This increased air pressure then serves to move the piston in the cylinder 39 to the left as viewed in FIGURE 2, thereupon reversing the direction of movement of the cable 36 and causing the carriage 29 to move to the right, until such time as it strikes the roller 59 on the limit switch 52 whereupon the cycle is reversed.

From the foregoing, it will be evident that the apparatus of the present invention provides a convenient means for continuously spraying a moving web. The ease of adjustability of the limit switches makes it possible to accommodate different width webs very conveniently, without prolonged shutdown of the equipment. Furthermore, the mechanical system is such that the spraying head itself is not subjected to excessive mechanical stresses during reciprocation, and can be operated at speeds substantially higher than comparable spraying devices of the past.

It should be evident that various modifications can be made to the described embodiments without departing from the scope of the present invention.

I claim as my invention:

1. An apparatus for applying a liquid impregnant to

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a moving porous web which comprises conveyor means for supporting a web for travel along a predetermined plane, guide means extending transversely to the path of movement of said conveyor means and spaced therefrom, a carriage reciprocable on said guide means, a spray means carried by said carriage, cable and pulley means on said guide means, said cable being connected to said spray means to reciprocate said spray means transversely to the path of movement of said conveyor means, first pneumatic means connected to said cable to effect such reciprocation, adjustable switch means selectively positionable along said guide means, and second pneumatic means operable by actuation of said adjustable switch means in response to movement of said spray means to actuate said first pneumatic means and reverse the direction of travel of said spray means.

2. The apparatus of claim 1 in which said guide means consists of a pair of spaced rods and said spray means is mounted for sliding movement between said rods.

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