

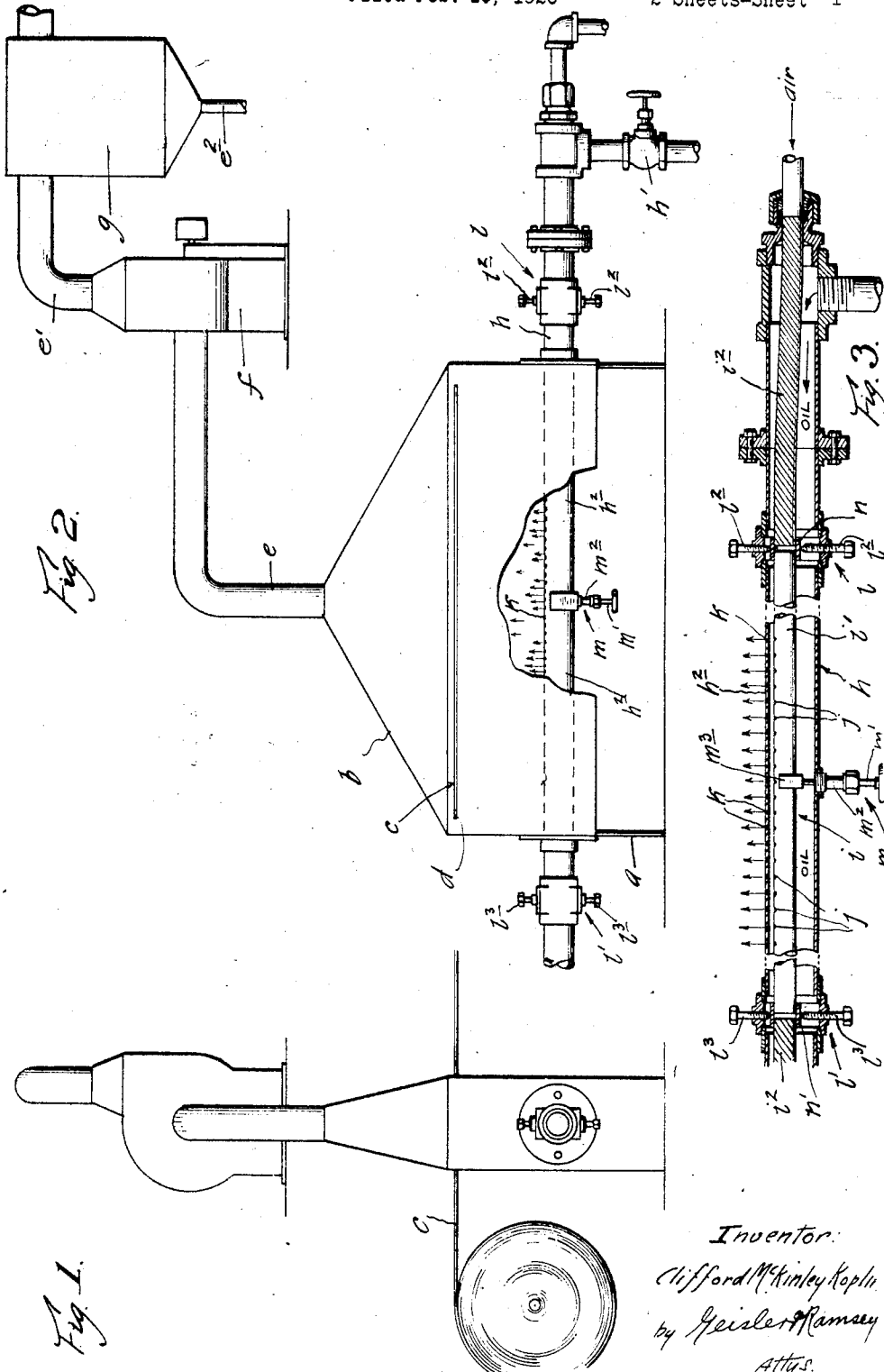
Feb. 19, 1929.

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C. McK. KOPLIN
OIL ATOMIZING DEVICE

Filed Feb. 15, 1926

2 Sheets-Sheet 1



Inventor:
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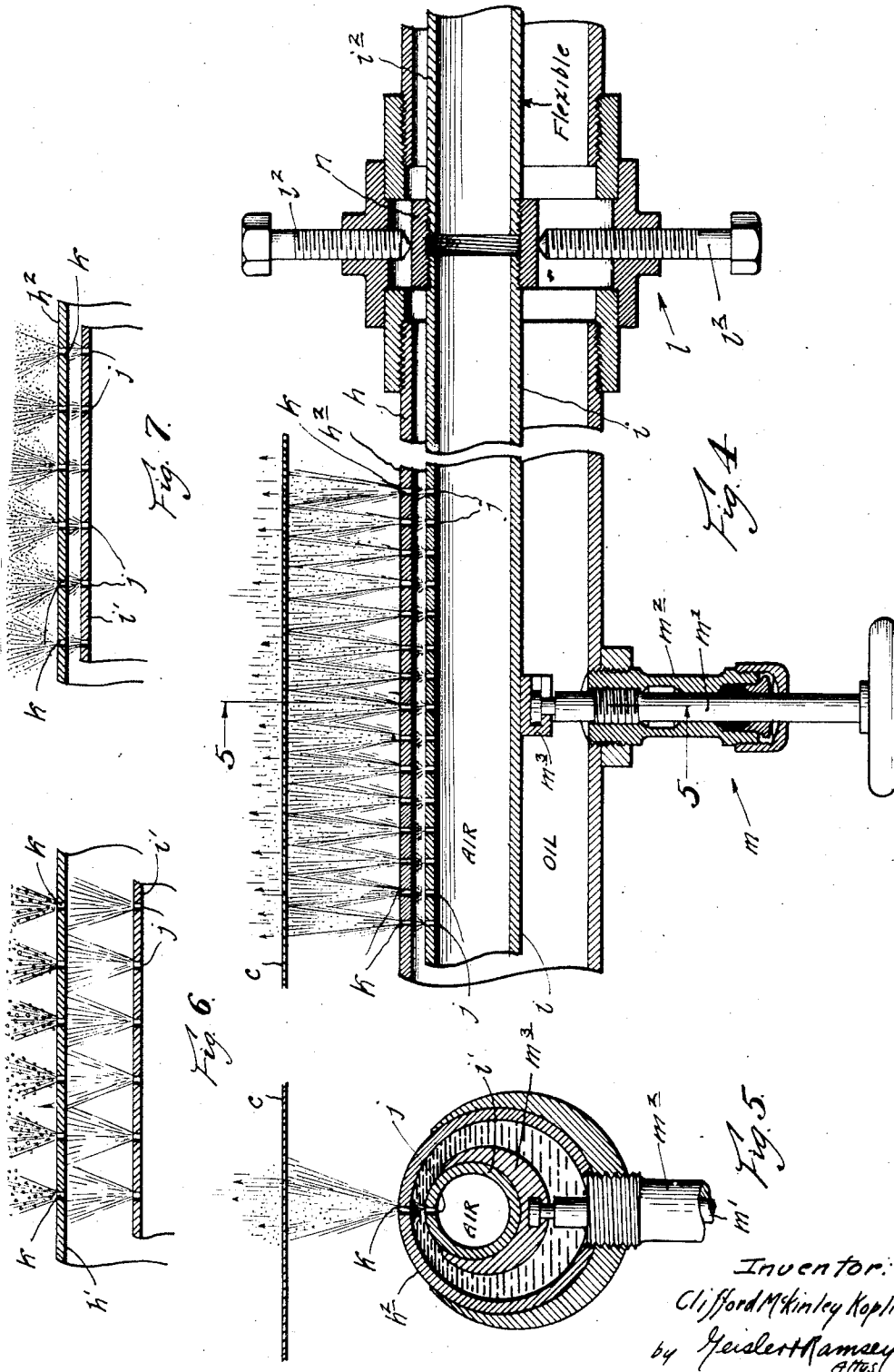
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UNITED STATES PATENT OFFICE.

CLIFFORD MCKINLEY KOPLIN, OF CAMAS, WASHINGTON.

OIL-ATOMIZING DEVICE.

Application filed February 15, 1926. Serial No. 83,387.

My invention relates to coating machines of the air brush type, in which articles to be coated are exposed to a spray of vaporized coating liquid.

5 My invention is particularly directed towards the impregnating of a continuous sheet of paper with preservative oil adapting the sheets for use as "fruit wraps". These sheets must have only a limited amount of oil applied thereto for otherwise they will become greasy to the touch, and yet enough oil must be applied to render the sheets substantially air and water proof, as required to adapt them for use as fruit wraps. To produce 15 oiled paper of this character, it is necessary to provide devices for controlling the spraying means so as to effect a uniform coating of desired degree.

Therefore one of the principal objects of 20 my invention is to provide spraying means capable of applying the spray uniformly along a surface or sheet of considerable length, and in regulated amount.

I attain my object in a coating machine, of 25 the type mentioned, comprising a housing in which are provided two tubes, one thereof preferably flexible and mounted within the other, and respectively provided with companion discharge orifices; the outer tube being 30 connected to the source of the liquid to be sprayed, and the inner conduit to a gas under pressure. The inner tube is supported in place within the outer conduit by adjustable means—preferably adjustable from the exterior of the outer tube—whereby to vary the 35 spacing between the companion orifices of the inner and outer tubes, in that way to vary the jet velocity of the spray emitted from the orifices of the outer tube, relatively to the 40 desired amount of the spray with which the surface or the sheet shall be coated.

Further details of construction and the mode of operation of my invention are hereinafter described with reference to the accompanying drawings, in which: 45

Fig. 1 is a diagrammatic side elevation of my improved coating machine shown merely in outline;

Fig. 2 is a front elevation thereof with part 50 of housing broken away;

Fig. 3 is an enlarged sectional view through the spraying device which embodies my invention;

Fig. 4 is a still larger scaled section through 55 the spraying means;

Fig. 5 is a transverse section taken on the line 5—5 in Fig. 4; and

Figs. 6 and 7 are diagrammatic views showing the manner in which the air serves to create a fog of atomized liquid. 60

In said drawings, I show a coating machine embodying my improved spraying means, the latter housed in a casing *a* and covered by a canopy-type hood *b*. The strip of material *c* to be coated or impregnated is passed under 65 said canopy through a slot *d*, which fits closely against the sides of the paper; said canopy and said casing providing, substantially, an air-tight enclosure. From the top of said canopy-like hood *b*, a discharge pipe *e* is led, 70 and connected to a fan *f* discharging through a second pipe *e'* to a condenser *g* by which the surplus condensed sprayed liquid is substantially recovered and returned to the supply thereof, through a pipe *e''*. 75

My improved spraying means comprise two conduits *h* and *i* mounted one within the other. The inner conduit *i* is connected to a head of air under about 20# pressure and the outer conduit *h* is connected to a supply of 80 oil or other liquid under sufficient pressure, preferably constant, to cause the liquid to flow into the pipe *h* and be discharged thru the jet-like orifices therein. A valve *h'* is preferably provided within said oil line *h* to 85 control the flow of oil therethrough and thus regulate the oil saturation of the article acted upon.

Said air line *i* is provided with one section *i'* which is relatively stiff and provided with 90 a series of spaced orifices *j*. The section of conduit *h''* housing the inner pipe section *i'* is provided with a similar series of companion orifices *k* in registration with the orifices *j*. The ends of the conduit section *i'* are connected 95 by flexible sections of tubing *i''* with the remainder of the air line. Said section of conduit *i'* is carried by a series of adjustable supports *l*, *l'* and *m*, the supports *l* and *l'* being arranged at the ends of said section, 100 and one or more of supports *M* being arranged intermediate said ends.

Said pipe section *i'* permits a slight amount of flexation so that by the adjustments of its said supports *m* relatively to the supports *l* 105 and *l'*, the spacing of said tube sections *i'* and *h''* may be varied along their lengths. This is necessary since mechanical imperfections in the size or location of the orifices *j* and *k*, or a slight clogging of a portion thereof, 110

might cause the spray at that point to be slightly less intense than at other portions.

Such adjustment is also necessary because, as illustrated by Figs. 6 and 7, the air under pressure emitted from the orifices j of the inner tube i tends to be forced out of the companion registering orifices k of the outer conduit or tube h^2 , with more or less jet velocity depending upon the relative closeness or spacing of said companion registering orifices, and the air jets emitted from the orifices j further tend to spread, and thus an increase in the said spacing tends to permit a greater degree of divergence in the air jets, and a relative diminishment in the velocity with which they are expelled through the orifices of the outer tube h , which will relatively effect the amount of spray discharged by the outer or spraying tube h . The spacing of said companion orifices also permits a thicker layer of oil to flow between the perforated wall portions of the inner and outer tubes. Hence, by providing adjustable means, such as the supports l , l' and m , I am enabled to vary the degree of the oil saturation of the sheet of paper along its entire length.

The supports l and l' comprise two opposed set screws l^2 and l^3 , respectively, each of said supports carrying a coupling n and n' between them, which couplings connect the section of air conduit i' with the flexible section i^2 , respectively.

The supports m comprise a stem m' threaded within a packed valve body m^2 carried by the outer conduit section h^2 . The inner end of said stem is rotatably connected to the conduit section i' by a forked clip m^3 , carried by said section i' .

Thus, by rotating said valve stem m' , the portion of said air conduit i' adjacent said support can be moved towards or from the adjacent wall of the tube h^2 .

I claim:

1. A coating machine of the type described comprising a housing, two tubes provided therein, one mounted within the other, and respectively provided with companion registering discharge orifices, aligned in transverse planes of said tubes, the outer tube being adapted to be connected to a source of liquid to be sprayed, and the inner to a gas under pressure, means supporting the inner tube relatively movable in transverse plane within the outer tube, such means adapted for adjusting the spacing between the companion orifices of the inner and outer tubes, relatively to the desired degree in jet velocity with which the spray shall be discharged.

2. In a coating machine of the type described, two tubes one mounted within the other, and respectively provided with companion registering discharge orifices aligned in transverse planes of said tubes, the outer tube being adapted to be connected to a source of liquid to be sprayed and the inner to a gas

under pressure, means supporting the inner tube relatively movable in transverse plane within the outer tube, said means being adjustable from the exterior of the outer tube, to vary the spacing between the companion orifices of the inner and outer tubes relatively to the desired degree in jet velocity with which the spray shall be discharged.

3. In a coating machine of the type described, two tubes, one mounted within the other, and respectively provided with companion registering discharge orifices, the outer tube being adapted to be connected to a source of liquid to be sprayed and the inner to a gas under pressure, and a series of adjustable spaced supports supporting the inner tube in place within the outer.

4. In a coating machine of the type described, two tubes, one mounted within the other, and respectively provided with companion registering discharge orifices, the outer tube being adapted to be connected to a source of liquid to be sprayed and the inner to a gas under pressure, a series of adjustable spaced supports, supporting the inner tube in place within the outer, said supports being adjustable from the exterior of the outer tube, whereby to vary the spacing between the companion orifices of the inner and outer tubes relatively to the desired degree in jet velocity with which the spray shall be discharged.

5. In a coating machine of the type described, two tubes one mounted within the other, and respectively provided with companion registering discharge orifices, the inner tube being flexible relatively to the adjacent orificed wall portion of the outer tube, the outer tube being adapted to be connected to a source of liquid to be sprayed and the inner to a gas under pressure, a series of adjustable spaced supports supporting the inner tube in place within the outer, whereby to vary the spacing between the companion orifices of the inner and outer tubes relatively to the desired degree in jet velocity with which the spray shall be discharged.

6. In a coating machine of the type described, two tubes one mounted within the other, and respectively provided with companion registering discharge orifices, the inner tube being flexible relatively to the adjacent orificed wall portion of the outer tube, the outer tube being adapted to be connected to a source of liquid to be sprayed and the inner to a gas under pressure, a series of adjustable spaced supports, supporting the inner tube in place within the outer, said supports being adjustable from the exterior of the outer tube, whereby to vary the spacing between the companion orifices of the inner and outer tubes relatively to the desired degree in jet velocity with which the spray shall be discharged.

CLIFFORD MCKINLEY KOPLIN.