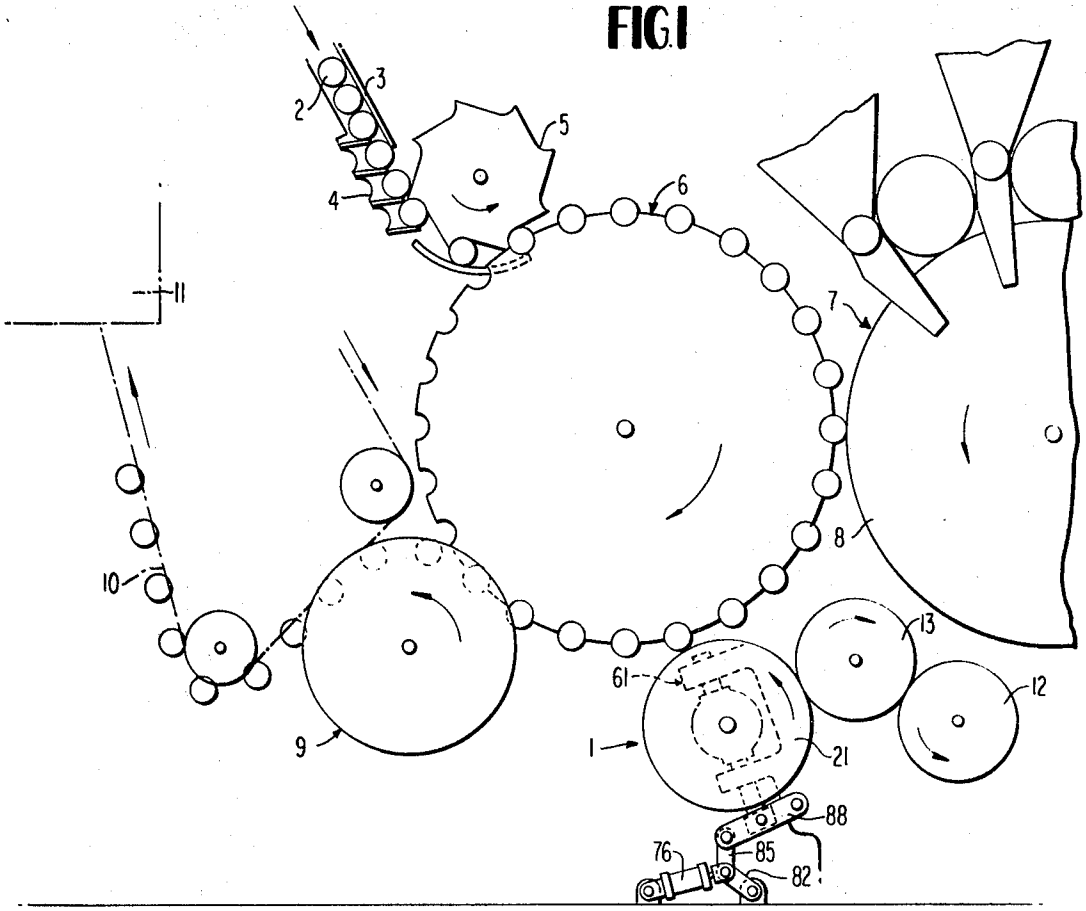
Nov. 2, 1971 E. SIRVET ET AL 3,616,778

OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

Filed June 12, 1969 5 Sheets-Sheet 1

FIG.1



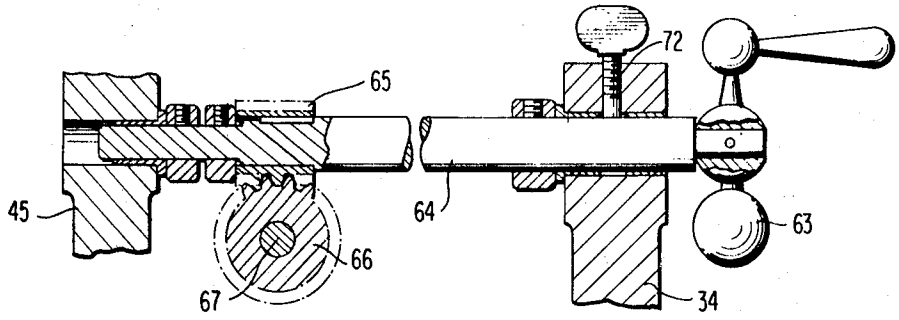


FIG.8

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OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

Filed June 12, 1969 5 Sheets-Sheet 2

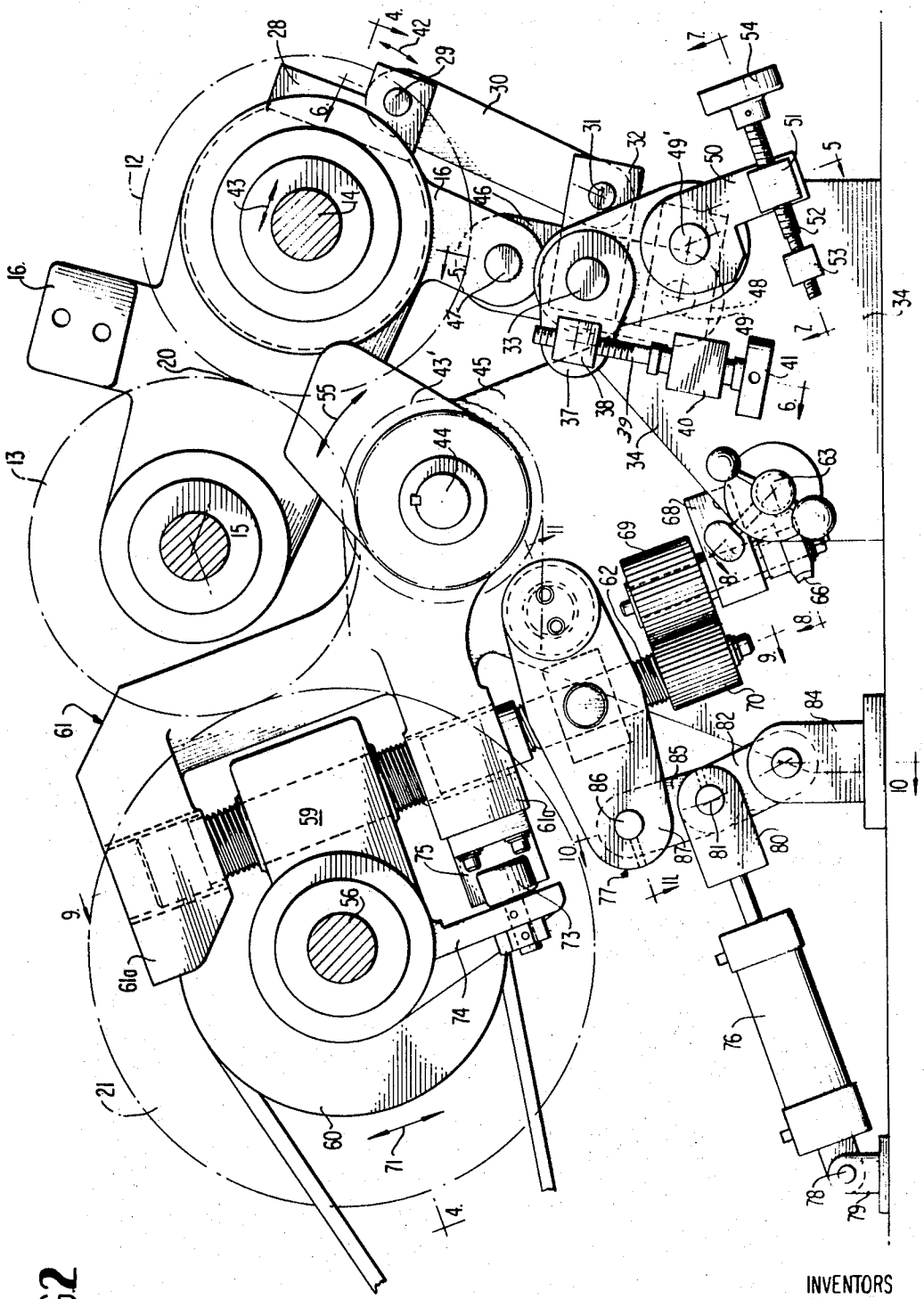


FIG2

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OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

Filed June 12, 1969 5 Sheets-Sheet 3

FIG.3

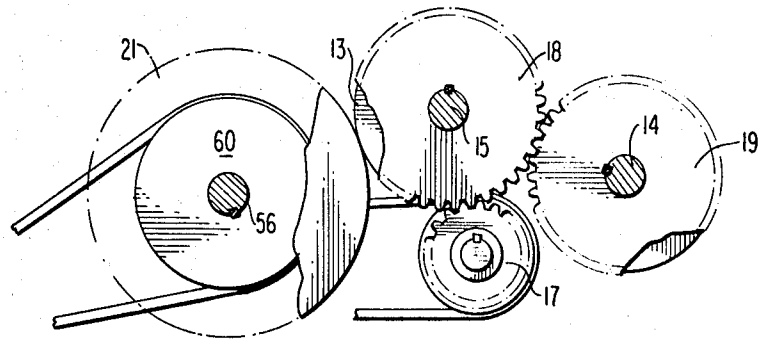


FIG.5

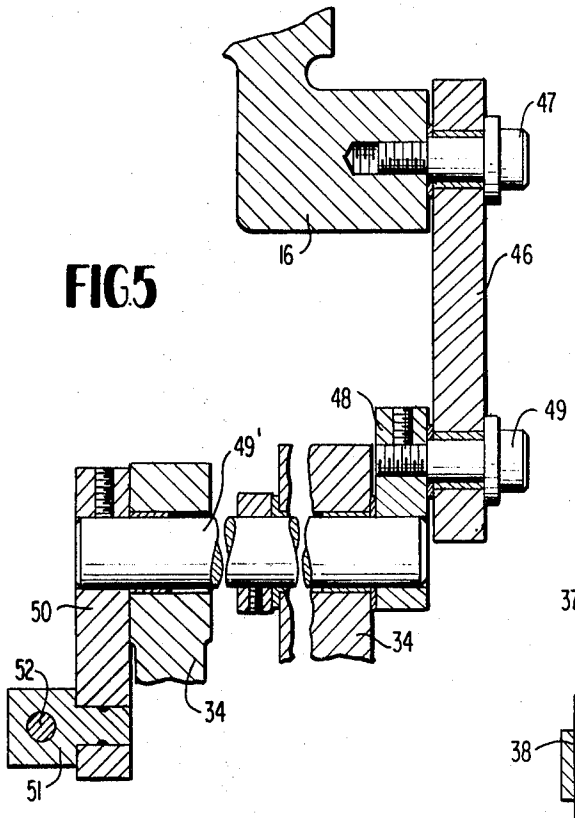
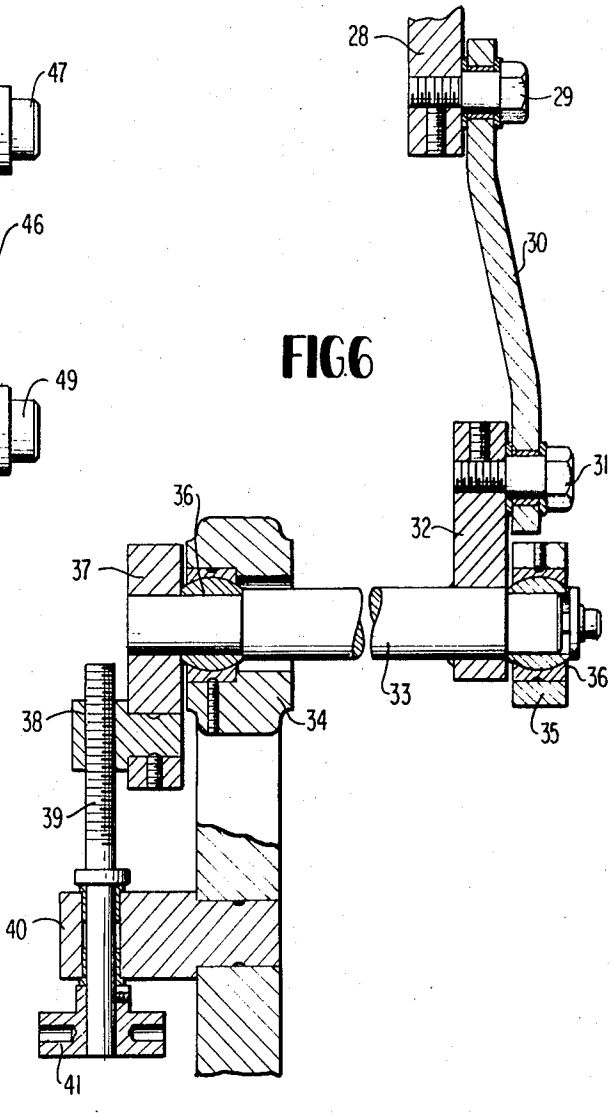


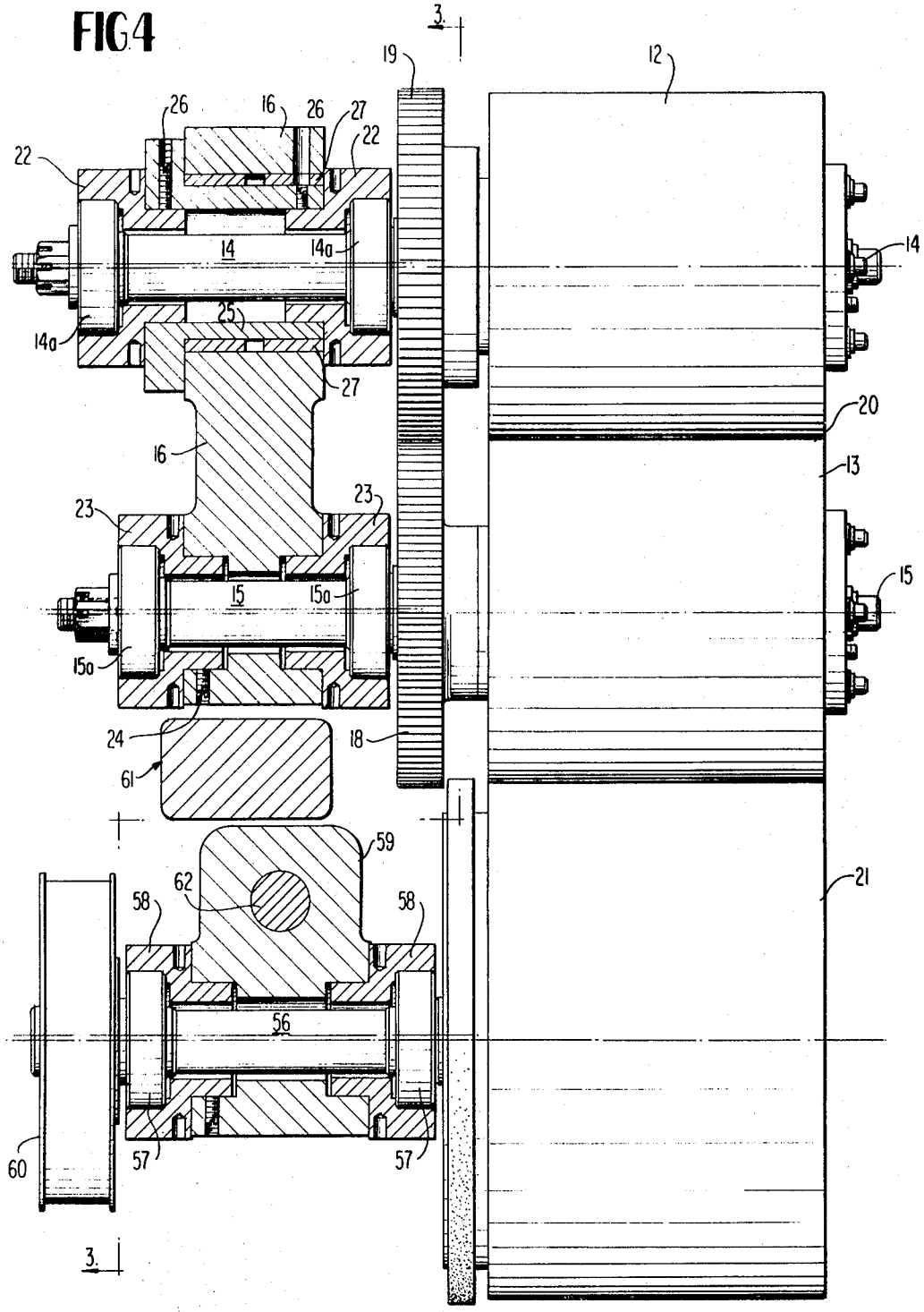
FIG.6



OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

Filed June 12, 1969 5 Sheets-Sheet 4

FIG 4



OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

Filed June 12, 1969 5 Sheets-Sheet 5

FIG7

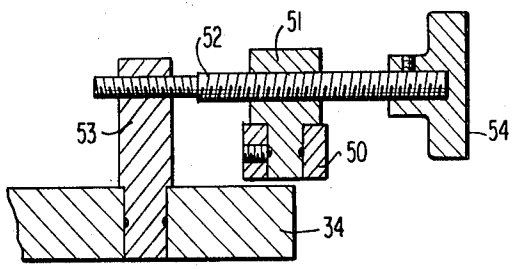


FIG10

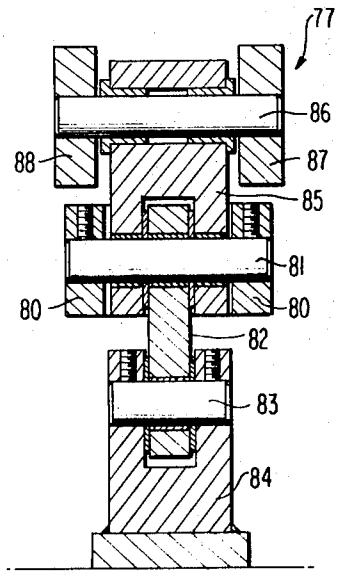


FIG9

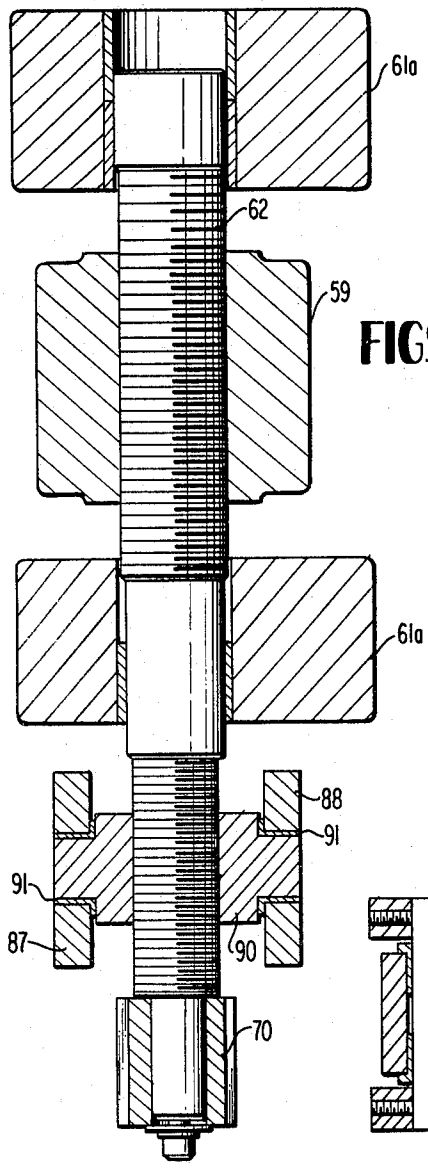
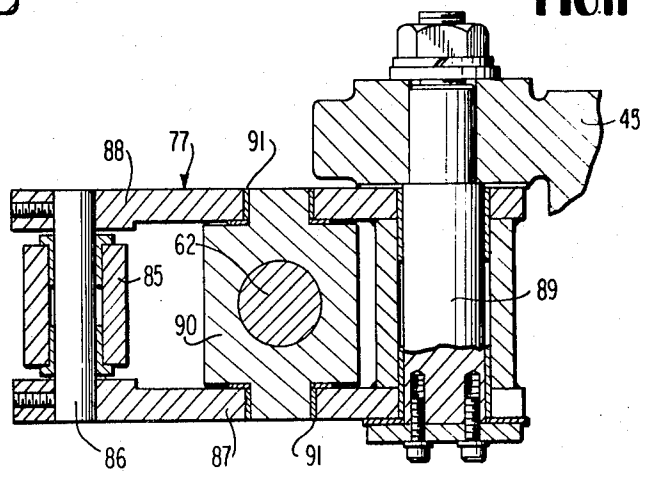


FIG11



United States Patent Office 3,616,778 Patented Nov. 2, 1971

3,616,778

OVERVARNISH ASSEMBLY FOR CONTINUOUS CAN PRINTING MACHINES

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Filed June 12, 1969, Ser. No. 832,765
Int. Cl. B05c 1/00
U.S. Cl. 118—262 7 Claims

ABSTRACT OF THE DISCLOSURE

A pair of metering rollers are adjustably mounted relative to each other, and as a unit relative to a coating roller for controlling the amount of varnish transferred to the coating roller; the coating roller being adjustable relative to a printed container, being conveyed from a printing station, whereby the thickness of the varnish coating applied to the exterior surface of the container may be controlled.

BACKGROUND OF THE INVENTION

In the printing or decorating of containers such as toothpaste tubes, beer cans, and the like, it is customary to coat the exterior surface of the container with a thin film of varnish or lacquer after the container has been conveyed through the printing station. It is well known in the art that the thickness of the film applied to the container is gauged by the relative positions of the rollers within the coating assembly; thus, accuracy is highly desirable in the spacing of these rollers. While the various known varnish coating assemblies have been satisfactory for their intended purpose, they have been open to certain objections particularly with regard to the accuracy with which the rollers may be adjusted and also the time required to accomplish this adjustment of the rollers.

SUMMARY OF THE INVENTION

To overcome the disadvantages experienced in heretofore employed coating assemblies, the coating assembly of the present invention has been devised for effecting accurate and speedy micro-adjustment of the coating assembly rollers, and comprises, essentially, a first linkage assembly operatively connected to a pair of metering rollers whereby one of the rollers may be adjusted relative to the other roller for controlling the amount of varnish transferred to the coating roller. A second linkage assembly is operatively connected to the metering rollers whereby the metering rollers may be adjusted as a unit relative to the coating roller, and a third linkage assembly is operatively connected to the coating roller whereby the coating roller may be adjusted relative to a printed container being conveyed from the printing station.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic view of the assembly showing its relationship to the printing machine;

FIG. 2 is a side elevational view showing the details of the adjusting mechanism for the rollers;

FIG. 3 is a fragmentary view of the drive train for the rollers;

FIG. 4 is a view taken along line 4—4 of FIG. 2;

FIG. 5 is a view taken along line 5—5 of FIG. 2;

FIG. 6 is a view taken along line 6—6 of FIG. 2;

FIG. 7 is a view taken along line 7—7 of FIG. 2;

FIG. 8 is a view taken along line 8—8 of FIG. 2;

FIG. 9 is a view taken along line 9—9 of FIG. 2;

FIG. 10 is a view taken along line 10—10 of FIG. 2; and

FIG. 11 is a view taken along line 11—11 of FIG. 2.

Referring to the drawings and more particularly to

FIG. 1, the varnish assembly 1 of the present invention is adapted to be used in conjunction with a container printing or decorating machine wherein undecorated containers 2 are fed down an inclined chute 3 to a worm screw 4 where they are separated and fed to a feed wheel 5. From the feedwheel, each undecorated container is deposited on a mandrel carrier assembly 6 which conveys the containers to a printing machine 7 wherein each container is printed or decorated by the blanket cylinder 8. The decorated containers are then sequentially conveyed past the overvarnish assembly wherein the outer surface of each container is coated with a thin film of varnish, lacquer or the like. The now decorated and coated containers are then conveyed to a transfer assembly 9 wherein they are sequentially transferred from the mandrel carrier assembly 6 to an endless conveyor 10 whereupon the containers are conveyed to a drying oven 11.

The details of the varnish assembly are illustrated in FIGS. 2 and 4 wherein it will be seen that the metering rollers, consisting of a coating control roller 12 and a transfer roller 13, are mounted on parallel shafts 14 and 15, respectively which are journaled within bearings 14*a*, 15*a* mounted on a frame assembly 16, rotational movement being imparted to the metering rollers by means of a belt drive gears 17 (FIG. 3) meshing with a pinion gear 18 secured to shaft 15, which in turn meshes with a similar gear 19 secured to shaft 14. The varnish is fed to the nip portion 20 of the metering rollers from a supply source (not shown) and as well understood by those skilled in the art, the spacing of the metering rollers at the nip portion determines the amount of varnish transferred to the coating roller 21. In order to effect the proper spacing between the coating control roller 12 and the transfer roller 13, the bearings 14*a*, 15*a*, carrying their respective shafts, are mounted within eccentric hub members 22, 23, respectively.

The eccentric hub members 23 are held in adjusted position within the frame 16 by means of a suitable set screw 24, and the eccentric hub members 22 are secured to a sleeve 25 by set screws 26, the sleeve being rotatably mounted within the frame 15 by a suitable bearing 27. By rotating the sleeve 25 and associated hubs 22, the micro-adjustment of the coating control roller 12 relative to the transfer roller 13 is effected. The rotation of the sleeve 25 is accomplished by means of a linkage assembly, the details of which are illustrated in FIGS. 2 and 6, wherein it will be seen that an arm 28 is secured to the end portion of sleeve 25, and pivotally connected as at 29 to the upper end of a link 30. The lower end of the link 30 is pivotally connected as at 31 to one end of an arm 32 having its opposite end rigidly secured to a shaft 33, rotatably mounted in support frames 34, 35 through bearings 36. A crank arm 37 is connected to the end of shaft 33, the crank arm carrying a threaded block 38 which receives the end portion of an adjusting screw 39, the screw stem being journaled within a support member 40 secured to the frame 34, and the end of the stem being provided with a suitable hand wheel 41.

From the above description it will be readily seen that when the adjusting screw 39 is rotated, the resultant movement of crank arm 37, shaft 33, arm 32 and link 30 will cause the arm 28 to move in the direction of the arrows 42, shown in FIG. 2. The movement of arm 32 will cause the sleeve 25 and associated eccentric hubs 22 to rotate thereby moving the coating control roller 12 in the direction of the arrows 43, shown in FIG. 2, whereby the space between the nip portion 20 of rollers 12 and 13 may be adjusted, thereby controlling the amount of varnish transferred to the coating roller 21.

As will be seen in FIGS. 2 and 5, adjustment of the metering rollers 12 and 13, as a unit, relative to the coat-

ing roller **21** is accomplished by providing an arm **43'** on the frame **16**, which carries the metering rollers, and pivotally connecting the arm at **44** to a support frame **45**. The micro-adjustment of the metering rollers **12** and **13** relative to the coating roller **21** is facilitated by a crank and linkage assembly comprising a link **46** having its upper end pivotally connected to the frame **16** as at **47**, the lower end of the link being pivotally connected to one end of an arm **48** as at **49**. The opposite end of the arm is secured to one end of a shaft **49'** journaled within frame **34**, the opposite end of the shaft having a crank arm **50**, secured thereto. The crank arm is provided with a threaded block **51** which receives an adjusting screw **52**, the free end of the adjusting screw being received within a support block **53** secured to the frame **34**, the opposite end of the adjusting screw being provided with a hand wheel **54**.

From the above description, it will be readily apparent that upon rotation of the adjusting screw **52**, the resultant movement of the crank arm **50**, arm **48** and link **46** will cause the arm **43'**, carrying the frame **16**, to move in the direction of the arrows **55**, FIG. 2, whereby the space between the transfer roller **13** and coating roller **21** may be adjusted.

Referring to FIGS. 2, 3 and 4, the coating roller **21** is secured to a shaft **56** which is journaled in suitable bearings **57** mounted within eccentric hubs **58** adjustably mounted within a leg member **59**, the end of the shaft being provided with a driven pulley **60**. As will be seen in FIGS. 2 and 9, the leg member **59** is disposed within the bight portion of a bifurcated arm assembly **61** and is threadably secured to an adjusting screw **62** journaled within the arms **61*a*** of the bifurcated arm assembly. Rotation of the adjusting screw **62** is effected by means of a hand wheel **63** (FIG. 8) secured to a shaft **64** journaled within support frames **34** and **45**, the shaft carrying a worm gear **65** which meshes with a gear **66**, secured to one end of a stub shaft **67** which is journaled within a bearing block **68** (FIG. 2) mounted in the frame **45**. The opposite end of the stub shaft is provided with a gear **69** which meshes with another gear **70** secured to the lower end of the adjusting screw **62**. It will thus be readily apparent that upon rotation of hand wheel **63**, the adjusting screw **62** will move leg members **59** between the arms **61*a***, thereby causing the coating roller **21** to move in the direction of the arrows **71**. By this construction and arrangement, the position of the coating roller **21** relative to a container carried by the mandrel assembly **6** may be adjusted. After the adjustment is made, the hand wheel **63** and associated shaft **64** are prevented from rotating by means of a set screw **72** (FIG. 8).

In order to maintain the coating roller **21** in alignment, a roller **73** (FIG. 2) is carried by a dependent arm **74** integrally formed on the leg member **59**, the roller engaging the surface of a flange member **75** secured to the lower arm **61*a*** of the bifurcated arm assembly. The stability of the coating roller is further enhanced by means of a fluid motor **76** connected to the adjusting screw **62** and frame **45** through a link and lever assembly designated generally by reference numeral **77** and as illustrated in detail in FIGS. 2, 10 and 11. As will be seen in these figures, the cylinder of the fluid motor is pivotally connected as at **78** (FIG. 2) to a support bracket **79**, and the end of the fluid motor piston rod is provided with a bifurcated arm **80** having a pin **81** (FIG. 10) extending between the arms. The upper end of a link **82** is pivotally connected to the medial portion of the pin **81** and the lower end of the link is similarly pivoted to a pin **83**, mounted in a support bracket **84**. The pin **81** also supports a depending bifurcated link **85** the arms of which are pivotally mounted on the pin between the upper end of link **82** and the arms **80**. The upper end portion of the link **85** is pivotally connected to a pin **86** which is secured to one end of a lever formed by a pair of spaced, parallel plates **87**, **88** (FIG. 11) the opposite end of the

lever being pivotally connected to a shaft **89** secured to the support frame **45**. A bearing block **90**, through which the adjusting screw **62** extends, is mounted between the plates **87** and **88** and journaled thereto as at **91**. By the construction and arrangement of fluid motor and toggle mechanism afforded by members **82**, **85** and **88**, the coating roller **21** is supported in an operative container-coating position when the fluid motor piston rod is in its extended position. Suitable controls are operatively connected to the fluid motor **76** to retract the piston rod thereby moving the coating roller to an inoperative, that is, non-coating, position in the event that there is a container missing from the mandrel carrier assembly, thus, eliminating contamination of an uncovered mandrel.

In setting up the overvarnish assembly for the coating oepration, the coarse adjustment of the rollers **12**, **13** and **21** is first accomplished through the adjustment of their respective eccentric hubs **22**, **23** and **58**. The micro-adjustment of the rollers is then accomplished, as described hereinabove, wherein rotation of hand wheel **63** causes coating roller **22** to move in the direction of arrows **71** to adjust the roller relative to a container carried by the mandrel assembly **6**. Rotation of hand wheel **41** causes the coating control roller to move in the direction of the arrows **43** relative to transfer roller **13**, and rotation of hand wheel **54** causes the rollers **12** and **13** to move as a unit in the direction of the arrows **55** relative to the coating roller **21**, whereby the amount of varnish or lacquer transferred to the coating roller may be controlled.

We claim:

1. A container coating assembly of the type wherein a supply of varnish or lacquer is fed to the nip portion of a pair of metering rollers, including a coating control roller and a transfer roller, said metering rollers being employed for transferring a predetermined amount of varnish to a container coating roller, the improvement comprising, first frame means, said metering rollers being rotatably mounted in said first frame means, first linkage means operatively connected to the pair of metering rollers whereby the position of the coating control roller may be changed relative to the transfer roller to thereby adjust the nip portion of the metering rollers, second frame means, means pivotally connecting said first frame means to said second frame means, said container coating roller being rotatably mounted within said second frame means, and second linkage means operatively connected to the metering rollers whereby the position of the metering rollers may be changed as a unit relative to the coating roller.

2. A container coating assembly according to claim **1**, wherein adjustment means are operatively connected to the container coating roller whereby the position of the container coating roller relative to a container to be coated may be adjusted.

3. A container coating assembly according to claim **1**, wherein said first linkage means comprises, an eccentric hub member rotatably mounted within said first frame means, a first shaft secured to said hub member, said coating control roller being secured to said first shaft, first arm means operatively connected to said eccentric hub member, one end of a link being pivotally connected to said first arm means, the opposite end of said link being pivotally connected to one end of a second arm means, the opposite end of said second arm means being secured to a second shaft, said second shaft being journaled within third frame means, a crank arm secured to the end of said second shaft, and adjusting screw means operatively connected to said crank arm, whereby when said adjusting screw means is rotated the resultant movement of the crank arm, second shaft, second arm means, and first arm means will cause the eccentric hub member to rotate thereby moving the coating control roller relative to the transfer roller whereby the nip portion of the rollers may be adjusted thereby controlling the amount of coating fluid transferred to the coating roller.

4. A container coating assembly according to claim **1**, wherein the second linkage means comprises, a link having

one end pivotally connected to said first frame means, the opposite end of said link being pivotally connected to one end of a second arm means, a shaft secured to the opposite end of said second arm means, a crank arm secured to said shaft, and adjusting screw means connected to said crank arm, whereby when said adjusting screw means is rotated the resultant movement of the crank arm, second arm means, and link will cause the first arm means to be rotated about the pivot means thereby moving the first frame means and associated metering rollers as a unit relative to the coating roller.

5. A container coating assembly according to claim 2, wherein the adjustment means comprises, an arm assembly operatively connected to said second frame means, adjusting screw means journaled in said arm assembly, one end of a leg member threadably received on said adjusting screw means, a shaft carried on the other end of said leg member, the coating roller secured to said shaft, and means for rotating said adjusting screw, whereby when said adjusting screw is rotated the leg member is moved relative to the arm assembly thereby changing the position of the coating roller relative to a container to be coated.

6. A container coating assembly according to claim 5, wherein stabilizing means are connected between the leg member and the arm assembly, said stabilizing means comprising an arm connected to said leg member, a roller connected to one end of said arm, and a flange member secured to said arm assembly and abutting said roller.

7. A container coating assembly according to claim 5,

wherein a reciprocating-type fluid motor is operatively connected to the second frame means and adjusting screw means through a link and lever assembly comprising, lever means having one end pivotally connected to said second frame means, the opposite end of said lever means having one end of a first link pivotally connected thereto, the opposite end of the link being pivotally connected to the end of the fluid motor piston rod, a second link having one of its ends pivotally connected to the end of the fluid motor piston rod, the opposite end of said second link being pivotally connected to a first support bracket, the fluid motor cylinder being pivotally connected to a second support bracket, and a bearing block pivotally connected to said lever means, said adjusting screw means extending through said bearing block.

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U.S. Cl. X.R.

101—148