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M. POLLMANN
MACHINES FOR MAKING RECESSED MOUTHPIECES FOR
FILTER CIGARETTES

2,843,132

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3 Sheets-Sheet 1

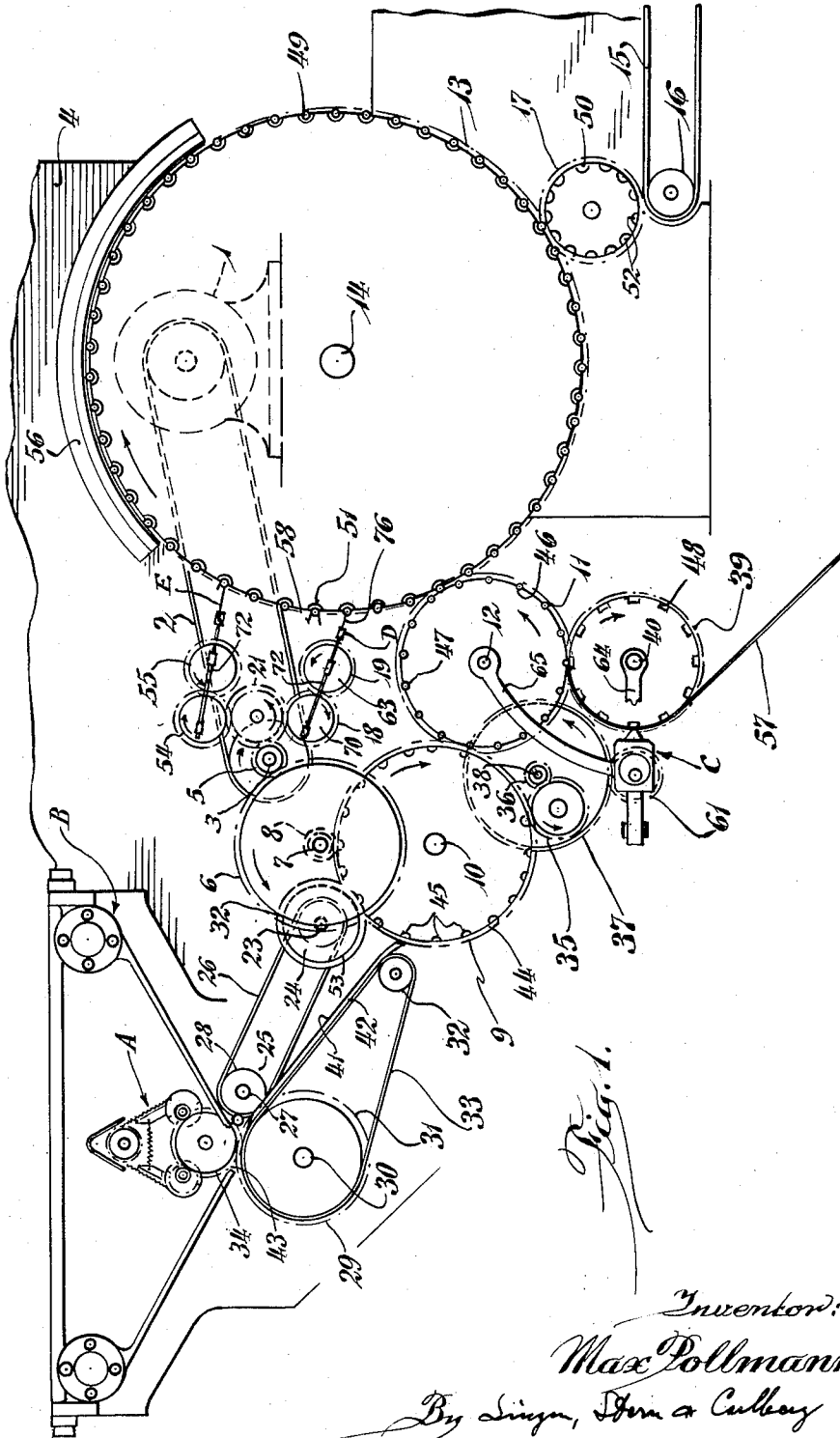


Fig. 1.

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Fig. 2.

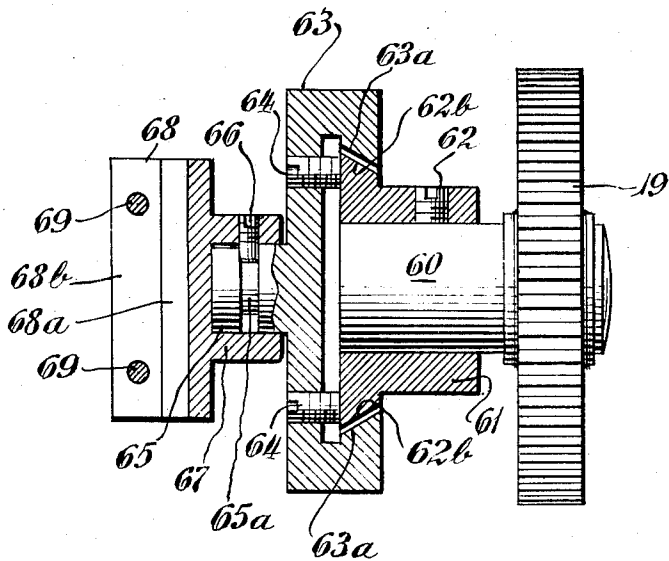
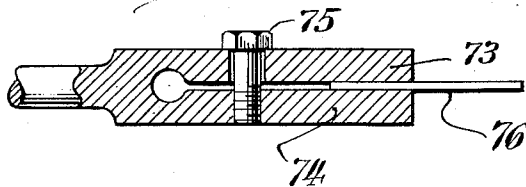


Fig. 3.



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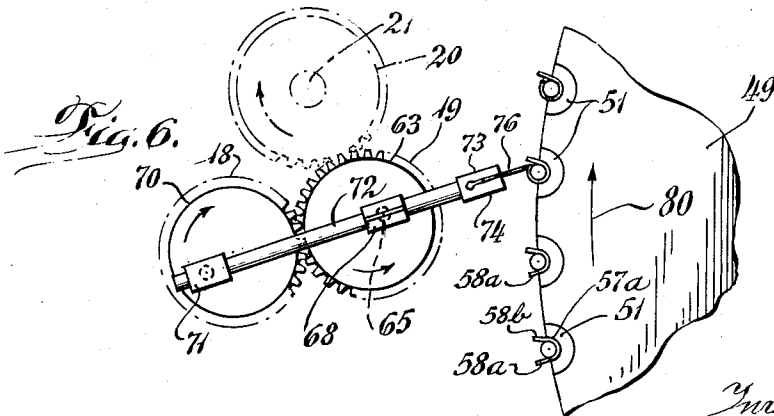
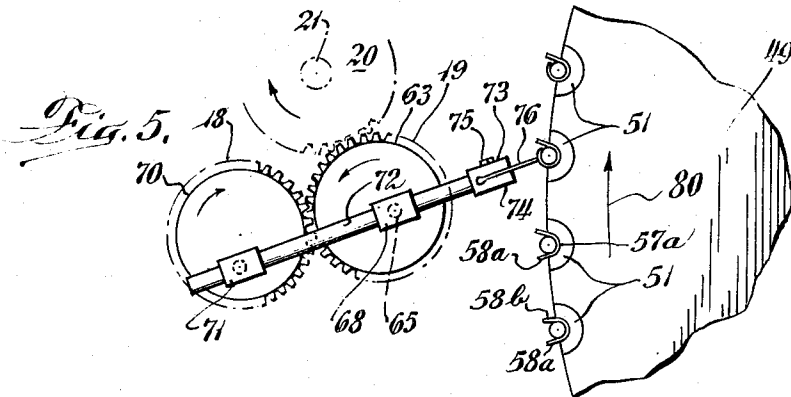
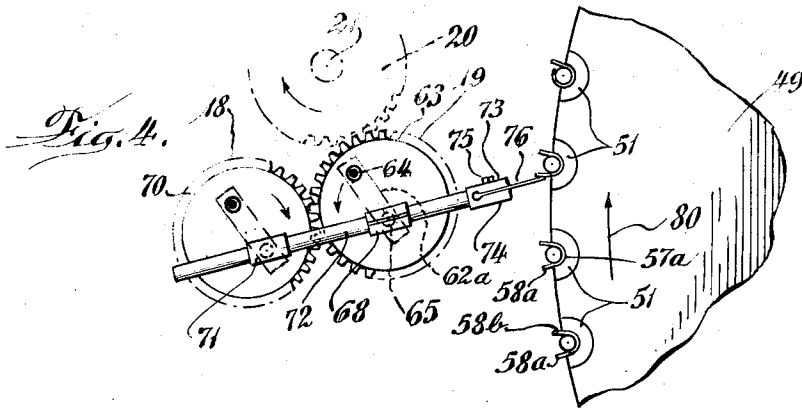
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MACHINES FOR MAKING RECESSED MOUTH-PIECES FOR FILTER CIGARETTES

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3 Claims. (Cl. 131-94)

The invention relates to improvements in machines for making recessed mouthpieces for filter cigarettes. More particularly the invention relates to improved means in such machines for wrapping a glued cover sheet around the filter plugs, preferably two or more at a time.

Known means for the purpose indicated are of several different types. A characteristic common to practically all of said types is the use of a rotary carrier drum in which the filter plugs and wrapping material are disposed in a plurality of axial grooves distributed over the circumference of the drum in such a way that the free ends of each wrapping sheet projects from the groove beyond the periphery of the drum.

In one known type of wrapping means employing such a carrier drum flexible fingers, or flaps, are mounted within the drum adjacent each groove and adapted to be extended automatically outwardly beyond the periphery of the drum to slide along the wrapping material and fold the free end portions thereof around the filter plugs. This constitutes a complex and expensive structure of limited dependability.

In another known type of wrapping means the grooves in the drum are so deep as to accommodate practically the entire filter plugs within the periphery of the drum and adjacent each groove means are provided on the peripheral surface of the drum which are adapted to slide on said surface against the projecting end portions of the wrapping material and thus force said end portions inwardly towards the filter plugs. As said folding means do not move any appreciable distance along the curved surface of the filter plugs, the quality of the work done by this type of wrapping means is frequently very unsatisfactory, principally because the wrapping material is not folded closely and uniformly around the filter plugs.

A third known type of means for the purpose indicated employs double-armed brushes rotating at a higher speed than the drum against the end portions of the wrapping material. Such brushes cannot be made to exert an even and uniform pressure on the wrapping material and as a result the quality of the work is unsatisfactory.

Through the invention the abovementioned and other disadvantages are eliminated.

An object of the invention is to provide novel and improved means for the purpose indicated in which a carrier drum similar to the grooved drums referred to above is used together with folding, or wrapping means disposed entirely outside the periphery of the drum and adapted to be actuated in controlled synchronism with the rotation of said drum to fold one or both of the free ends of the wrapping material around the filter plugs.

Another object of the invention is to provide novel and improved means of the kind indicated in which a ram carrying a folding blade is swingably mounted on two crank wheels, or eccentrics, rotatably disposed adjacent each other with the folding blade adapted to move in engagement with one of the free end portions of the

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wrapping sheet at a different speed than that of said wrapping sheet so as to slide on said end portion and fold it closely along the surface of the filter plugs.

A further object of the invention is to provide novel and improved means of the kind indicated above in which the two crank wheels, or eccentrics, are operatively connected to rotate in timed relation to each other and to the carrier drum.

Still another object of the invention is to provide novel and improved means of the character indicated in which the carrier drum and the two eccentrics are interconnected by gear trains driven from a common source of power.

A further object of the invention is to provide novel and improved means of the kind indicated in which the ram is pivotally mounted on one of said eccentrics and pivotally and slidably connected to the other eccentric.

Other objects and advantages will be apparent from the following description in conjunction with the accompanying drawings in which:

Fig. 1 is a diagrammatic front elevational view of a machine in which my invention is incorporated,

Figs. 2 and 3 are sectional views of details of my invention, and

Figs. 4, 5 and 6 are diagrammatic views illustrating functional steps of my invention.

In Fig. 1 an electric motor 1 is drivingly connected by means of a belt 2 with a shaft 3 that is rotatably mounted in a substantially vertical supporting frame 4. The motor 1 is suitably supported on the same frame 4 which substantially may consist of a suitably supported vertical steel plate carrying substantially the entire drive mechanism described herein on its rear side. On the shaft 3 a gear wheel 5 is secured in meshing engagement with a gear wheel 6 secured to a shaft 7 rotatably mounted in the frame 4 and carrying secured thereto another gear wheel 8 which in turn is in meshing engagement with a further gear wheel 9 secured to a shaft 10 also mounted in the frame 4. The gear wheel 9 is in meshing engagement with a gear wheel 11 secured to a shaft 12 mounted in the frame 4, and the gear wheel 11 is in turn in meshing engagement with a gear wheel 13 secured to a shaft 14 mounted in the frame 4. A conveyor 15 is drivingly connected with the gear wheel 13 through the intermediary of meshing gear wheels 16, 17.

Two intermeshing gear wheels 18, 19 are adapted to be driven by the gear wheel 5 on the shaft 3 through the intermediary of a gear wheel 20 mounted on a shaft 21 and meshing with gear wheels 5 and 18. The gear wheel 9 on the shaft 10 is in meshing engagement with a gear wheel 22 on a shaft 23 which also has secured thereto a pulley 24 drivingly connected with a second pulley 25 by means of a belt 26. The pulley 25 is secured to a shaft 27 which also has secured thereto a gear wheel 28 in meshing engagement with a gear wheel 29 secured to a shaft 30 which in turn has secured thereto one of the pulleys 31 of a pair of pulleys 31, 32 around which a belt 33 is mounted. A stirring device A in a container, or hopper, B mounted on the front of the frame 4 is drivingly connected with the gear wheel 28 through the intermediary of suitable means.

The gear wheel 9 is also drivingly connected with a cutting device C on the front of the frame 4 through the intermediary of gear wheels 35, 36, 37 and a shaft 38 to which the gear wheels 36 and 37 are secured. Finally, the gear wheel 11 is in meshing engagement with a gear wheel 39 secured to a shaft 40 that like all the shafts referred to above is mounted in the frame 4.

The pulleys 31, 32 together with the belt 33 are mounted on the front of the frame 4 and the belt 33 is of a width corresponding to the total length of a predetermined number of filter plugs. Along the upper reach of the belt 33

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a guide plate 41 is secured in such a manner as to form, together with said upper reach of belt 33, a chute 42 extending substantially from a bottom opening 43 in the container B to the periphery of a transfer drum 44 secured to the shaft 10 on the front side of the frame 4. Said transfer drum 44 has in its periphery a plurality of transverse grooves 45 each adapted to receive and hold the abovementioned predetermined number of filter plugs although in contrast to the belt 33 with a space between the individual filter plugs as will presently be explained. Accordingly, the width of said transfer drum 44 is somewhat greater than the width of the belt 33.

A second transfer drum 46 of the same width as the drum 44 is secured to the shaft 12 on the front of the frame 4 with its periphery in close proximity to the periphery of the drum 44. Said second transfer drum 46 has grooves 47 similar to the grooves 45 and is disposed with its periphery in close proximity to those of a suction drum 48 on the shaft 40 and a third transfer drum 49 secured to the shaft 14. A fourth transfer drum 50 is mounted between the drum 49 and the conveyor 15, as shown, and the drums 49, 50 have transverse grooves 51, 52, respectively, similar to the grooves 45, 47. The drums 46, 48, 49, 50 and the conveyor band 15 are substantially of the same width as the drum 44. The shaft 23 carries on its end portion protruding to the front of the frame 4 a plurality of circular knives 53 extending to or slightly below the bottom of the grooves 45 in the drum 44. On the protruding end portions of the shafts carrying the gear wheels 18, 19 a folding device indicated generally by D is mounted for a purpose to be explained below. A similar folding device E is mounted at a distance above the device D and driven by the gear wheel 20 through the intermediary of gear wheels 54, 55. A shield 56 surrounds the top portion of the drum 49, as shown.

Briefly, in operation the container B holds a supply of filter plug rods each corresponding in length to a predetermined number of individual filter plugs for filter cigarettes. With the aid of the stirring means A said rods are fed successively to the chute 42 from which they are deposited in the grooves 45 of the transfer drum 44. The circular knives 53 cut the rods into individual filter plugs and wedge-shaped means (not shown) adjacent said knives separate the filter plugs so as to space them from each other in the grooves 45.

The aligned rows of filter plugs are then successively transferred—in a manner well known in the art—to the grooves 47 in the drum 46 and moved past the suction drum 48. A paper strip 57 is held by suction on the drum 48 and cut in suitable places by the cutting means C so as to form cover sheets for the filter plugs. The paper strip 57 has been previously glued on the side not in contact with the drum 48 by means not shown and the severed pieces are moved on the suction drum 48 into adhering contact each with a row of aligned filter plugs in the grooves 47. With the adhering paper pieces at the bottom filter plugs are thereafter transferred to the grooves 51 in the drum 49 so that the free ends of the cover pieces protrude from both sides of said grooves 51 as indicated at 58. The folding device D then folds one of the protruding end portions 58 around the filter plugs in the grooves 51 and the folding device E performs the same function with the other protruding end portion 58. In a modified embodiment the folding device E may be dispensed with and the second protruding cover end 58 may then be folded simply by engagement with the end of the shield 56. The wrapped filter plugs are then transferred to the conveyor 15 by the intermediary of the drum 50.

The present invention is specifically concerned with improvements in the folding devices D and E and will be described in detail with reference to the folding device D, the difference between the two devices D and E being a matter of adjustment only. The gear wheels 18,

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19 are secured to horizontal shafts rotatably mounted in the frame 4. The shaft 60 carrying the gear wheel 19 is shown in Fig. 2. On the end of said shaft 60 extending to the front side of the frame 4 a support member 61 is secured in any suitable manner, as by means of a set screw 62. The front end portion of said member 61 forms a bar 62a having straight parallel side surfaces 62b which are inclined rearwards and inwards as indicated in Fig. 2.

A disc 63 is provided in its rear side with straight guide surfaces 63a mating with the side surfaces 62b of the bar 62 and said disc 63 can be locked in any position of adjustment on said bar 62 by means of set screws 54 threadedly extending through the disc 63 and abutting against the front surface of the bar 62 to press the surfaces 63a firmly against the surfaces 62b. A pin 65 is formed integrally with the disc 63 and extends forwardly from the front face thereof. Said pin 65 is provided with a circumferential groove 65a into which a guide screw 66 projects, said guide screw 66 extending through a hub 67 of a holding member 68 to enable said holding member 68 to rotate freely on said pin 65 while being prevented from axial movement on the same. The holding member 68 has a longitudinal bore 68a therethrough and along one side of said bore the holding member is split and provided with opposing flanges 68b which may be clamped towards each other by means of screws 69 in any well known manner.

A second disc 70 is connected with the shaft (not shown) of the gear wheel 18 in a similar manner as the disc 63 to the shaft 60 of the gear wheel 19. Said disc 70 has a holding member 71 mounted thereon in the same manner as the holding member 68, the only difference between the two holding members being that the holding member 71 is not split and lacks flanges corresponding to the flanges 68b and the screws 69. A rod 72 extends through the bores of the holding members 68, 71 and is clamped in the holding member 68 by means of the screws 69. Accordingly, it is obvious that said rod 72 is pivotally connected with the disc 63 and pivotally and slidably connected with the disc 70. It is evident to a person skilled in the art that this type of connection between the rod 72 and the shafts of the gear wheels 18 and 19 may be effected in a number of various ways of which the one shown and described is an example only.

The rod 72 is provided at one end with two jaws 73, 74 adapted to be clamped towards each other by screws 75 and held between said jaws is a flat, preferably somewhat flexible folding member 76 of a width substantially equal to the width of the periphery of the drum 49. The pin 65 and the corresponding pin on the disc 70 are preferably disposed eccentrically on said discs and it is obvious that the degree of eccentricity may be adjusted by adjustment of the position of the discs on the bar 61 and the corresponding bar carrying the disc 70. Additional adjustment of the relative position of the pins may be effected by pivotal movement of the support member 61 on the shaft 60. Through these various adjustment possibilities in conjunction with the fixed gear connection between the drum 49 and the discs 63, 70 the free edge of the folding member 76 may be caused to describe an endless curved path in the proximity of the periphery of the drum 49 as said drum rotates. In the case of the folding device D said path takes the edge of the folding member 76 from a retracted position towards the drum into engagement with the lower end portion 58a of a filter covering piece 58 in a groove 51. This approximate position is shown in Fig. 4, the direction of rotation of the drum 49 being indicated by the arrow 80.

As the rotation of the drum 49 progresses, the member 76 moves upwardly at a slightly higher speed than the groove 51, thereby sliding on the end portion 58a of the cover piece 58 and forcing the glued side thereof

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into contact with the filter plugs in the groove. An intermediate stage is indicated in Fig. 5, and at the stage illustrated in Fig. 6 the folding of the end portion 58a is completed and the folding member 76 releases the cover piece and continues its curved endless path away from the drum and back towards the same in time to perform the same function on the next cover piece 58. The operation of the folding device E is identical with that of D with the exception that the path of the folding member of E is adjusted so as to cause said folding member to move at a slightly lower speed than the respective groove 51 while in contact with the end portion 58b of the cover piece 58, whereby said end portion 58b is folded downwards onto the filter plugs and the outside of the end portion 58a, thus completing the wrapping of the filter plugs.

While a preferred embodiment of the invention has been shown and described, many modifications thereof may be made by a person skilled in the art without departing from the spirit of the invention, and it is intended to protect by Letters Patent all forms of the invention falling within the scope of the following claims.

What I claim is:

1. In a machine for making recessed mouthpieces for filter cigarettes, a drum mounted for rotation on a horizontal axis, a plurality of axial grooves in the periphery of said drum uniformly distributed therearound and each adapted to receive a plurality of aligned filter plugs having a common cover sheet partly wrapped around said filter plugs with a glued side in engagement therewith and with the free ends of said cover sheet projecting from said groove, means for rotating said drum, a pair of rotary members, means supporting said pair of rotary members for rotation on axes parallel with each other and with the axis of the drum and disposed outside the periphery of said drum, elongated means extending across

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said pair of rotary means perpendicularly to the axes thereof towards the periphery of said drum, folding means secured to the end of said elongated means nearest said drum, means pivotally connecting said elongated means to one of said rotary members at a point thereof spaced from the axis of said one rotary member, means pivotally and slidably connecting said elongated means to the other rotary member at a point thereof spaced from the axis of said other rotary member, and means operatively connecting said pair of rotary members with said drum for rotating said pair of rotary members in timed relation to said drum, whereby said folding means is caused to engage one of said projecting portions of the cover sheet adjacent the periphery of the drum and to slide on said projecting portion so as to fold it on the filter plugs in said groove of the drum.

2. The machine as set forth in claim 1, in which said pair of rotary members are interconnected by means of meshing gear wheels.

3. The machine as set forth in claim 1, including a second pair of rotary members, a second elongated member with second folding means similarly connected with said second pair of rotary members, and means operatively connecting said second pair of rotary members with said drum for rotating said second pair of rotary members in timed relation to said drum, the arrangement being such as to cause one of said folding means to move in engagement with one end portion of the cover sheet at a slightly higher speed than the periphery of the drum and to cause the other folding means to move in engagement with the other end portion of the cover sheet at a slightly lower speed than the periphery of the drum, whereby the two end portions of the cover sheet are successively folded around the filter plugs to complete the wrapping.

No references cited.