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Kanner et al.

[11] **3,798,870**

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[54] **METHOD AND APPARATUS FOR APPLYING A JACKET TO AN ELONGATED BODY**

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[21] Appl. No.: **247,053**

[52] **U.S. Cl.** **53/30,** 53/187, 53/386

[51] **Int. Cl.** **B65b 43/08**

[58] **Field of Search** 53/29, 30, 183, 271, 272, 53/187, 186, 386, 291, 292, 367

[56] **References Cited**

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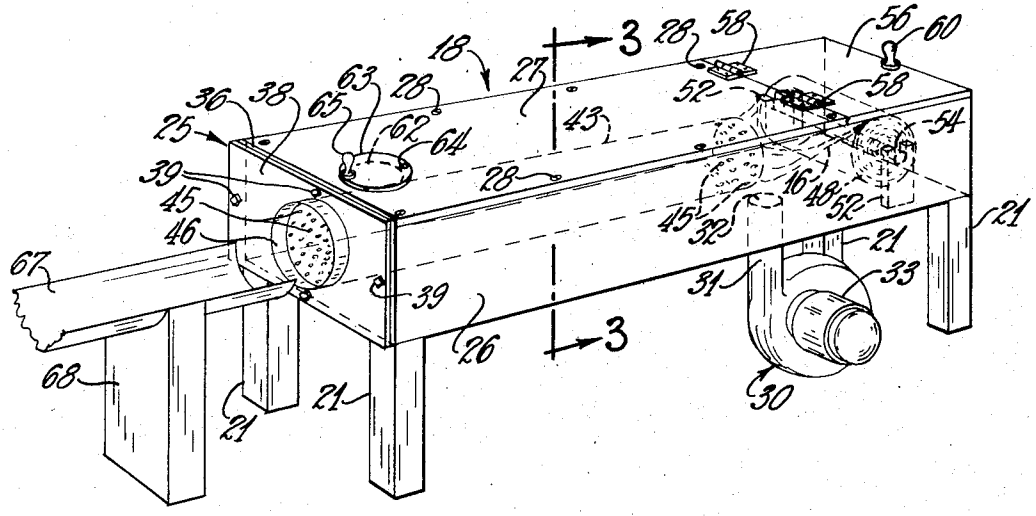
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Assistant Examiner—W. D. Bray
Attorney, Agent, or Firm—Staelin & Overman, Mr. Harry O. Ernsberger

[57] **ABSTRACT**

The disclosure embraces a method of and apparatus for withdrawing tubular jacketing or organic film material from a supply and applying the withdrawn portion onto an elongated body such as a tubular fibrous duct involving expanding the withdrawn portion of the film material by differential pressure, inserting the elongated body in the withdrawn expanded portion, and equalizing the pressures to contract the withdrawn portion to snugly engage and encase the body.

17 Claims, 7 Drawing Figures



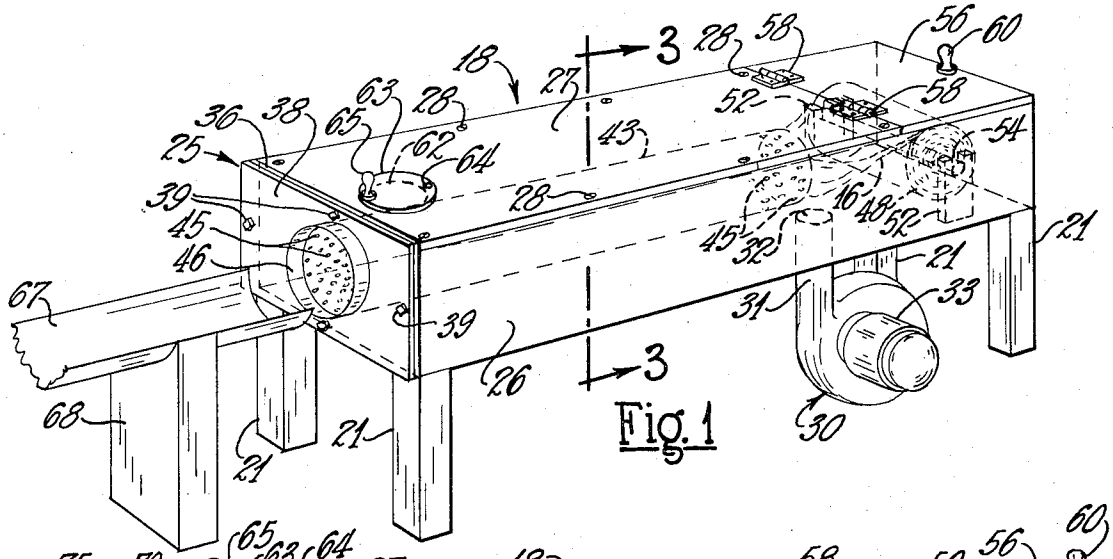


Fig. 1

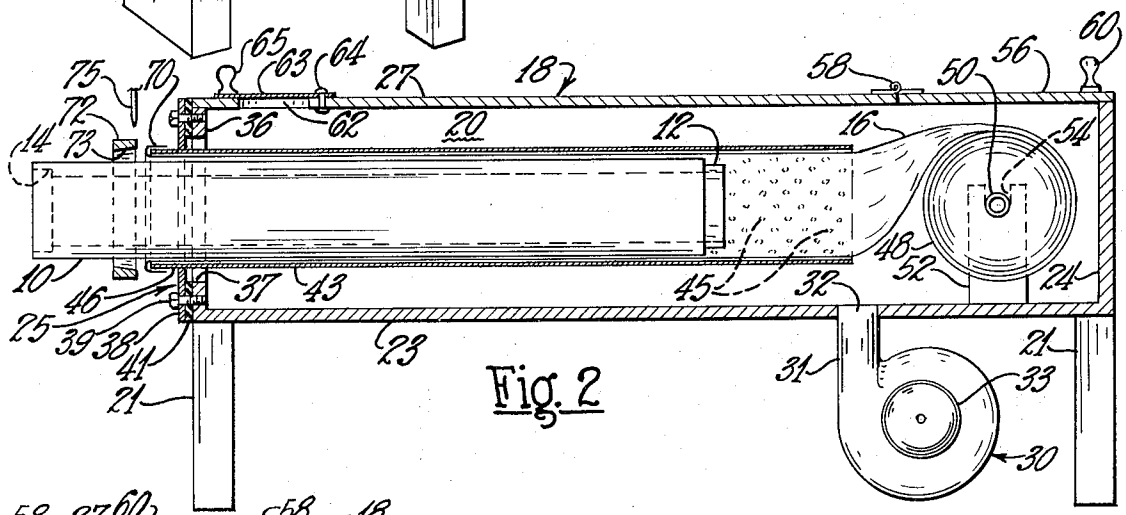


Fig. 2

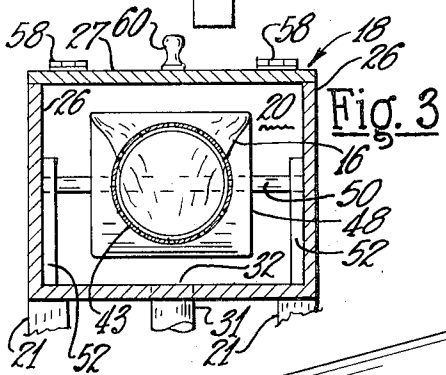


Fig. 3

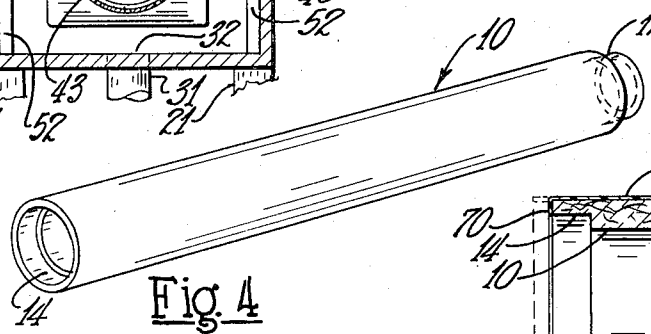


Fig. 4

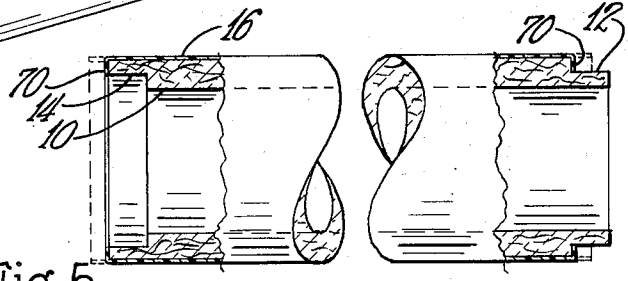


Fig. 5

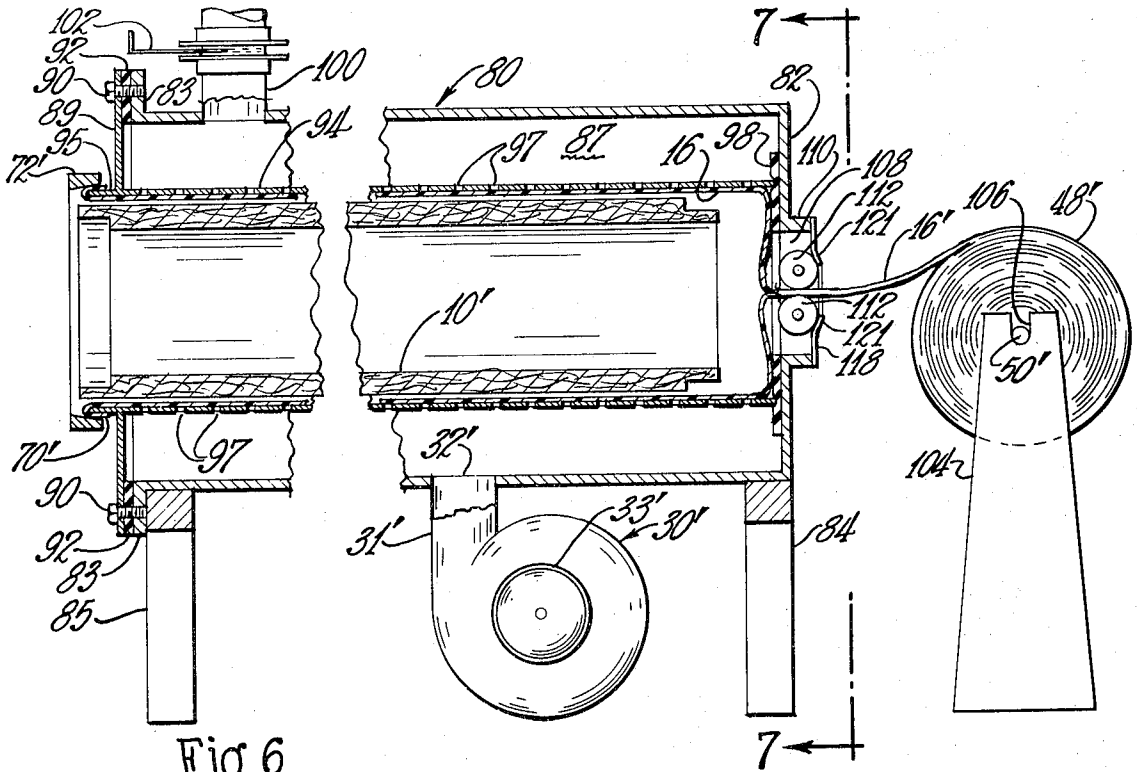

102
92
90
89
95
72'
83
100
94
80
82
97
87
16
98
110
108
112
121
16'
106
48'
10'
112
121
118
50'
104
70'
97
90
92
83
85
32'
31'
33'
30'
84
7
7

Fig. 6

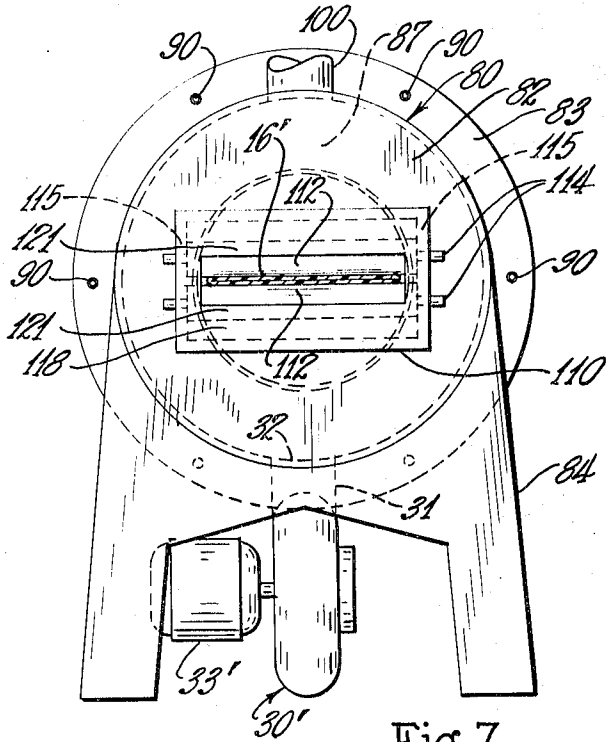

90
100
87
90
80
82
83
115
114
16'
112
115
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90
90
121
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32
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31
33'
30'

Fig. 7

METHOD AND APPARATUS FOR APPLYING A JACKET TO AN ELONGATED BODY

The invention relates to a method of and apparatus for encasing an elongated body, such as a substantially rigid tubular fibrous duct section, with a jacket of organic or plastic film by withdrawing tubular plastic film from a supply and expanding or stretching the withdrawn portion of tubular film, inserting the tubular body or fibrous duct section into the withdrawn expanded portion, and contracting the withdrawn portion to snugly engage the exterior of the body or duct section. Tubular duct sections of this character may be utilized in air duct systems for conveying air in both air heating and air cooling systems.

Rigid fibrous duct sections have been heretofore fashioned by inserting a mass of binder-impregnated fibers in a mold, curing the binder and applying a cloth cover by wrapping the cloth around the molded section. Cloth coverings are of porous character and do not function as moisture barriers. As a cloth covering is porous, permitting the circulation of air through the cloth, the insulating value of such construction is greatly reduced.

Rigid fibrous ducts have heretofore been encased in heat-shrinkable film material, a construction which has not proven to be entirely satisfactory particularly where the duct is used or stored in a high or low temperature environment. When a body encased in a heat-shrinkable jacket is used in high temperature areas the jacket continues to shrink, increasing the liability of the jacket to tear or split. When a heat-shrinkable jacket is subjected to a low temperature environment it tends to become brittle, increasing the liability of the material to split or fracture.

The present invention embraces a method of applying to an elongated body a tubular jacket of material of a character which may be expanded or stretched by differential pressures, withdrawing a portion of the jacketing material from a supply of the material, expanding the withdrawn portion, telescoping the expanded withdrawn portion of the jacketing material and elongated body to dispose the jacket around the body, equalizing the pressures to contract the jacket into intimate engagement with the tubular body, and severing the withdrawn portion on the elongated body from the supply.

Another object of the invention resides in a method of encasing a tubular body within a tubular jacket of comparatively thin film material wherein the film is withdrawn from a supply roll of the tubular film in flattened condition and reduced pressure established in a chamber containing the withdrawn film to expand the tubular film, inserting a tubular body into the expanded film and equalizing the pressure to contract the expanded film into intimate engagement with the body.

Another object of the invention is the provision of an apparatus for applying a tubular film to a tubular body including a chamber adapted to contain an expandable tubular film, the arrangement embodying means for establishing reduced pressure in the chamber to expand the film in conjunction with means for limiting the expansion of the film to provide clearance whereby the film and the tubular body may be telescoped together, and the chamber vented whereby the film is contracted into intimate engagement with the tubular body.

Further objects and advantages are within the scope of this invention such as relate to the arrangement,

operation and function of the related elements of the structure, to various details of construction and to combinations of parts, elements per se, and to economies of manufacture and numerous other features as will be apparent from a consideration of the specification and drawing of a form of the invention, which may be preferred, in which:

FIG. **1** is an isometric view of an arrangement for performing the steps in the method of the invention;

FIG. **2** is a longitudinal vertical sectional view of the arrangement illustrated in FIG. **1**;

FIG. **3** is a detail sectional view taken substantially on the line **3—3** of FIG. **1**;

FIG. **4** is an isometric view of a tubular fibrous body of a character adapted to receive a jacket;

FIG. **5** is an enlarged view, partly in section, illustrating the jacket in contracted condition on a tubular body;

FIG. **6** is a fragmentary longitudinal sectional view illustrating a modified arrangement for performing steps in the method of the invention, and

FIG. **7** is an end view of the arrangement shown in FIG. **6.**

While the method of the invention is illustrated in applying expandable tubular jacketing material onto a tubular fibrous body or duct section of a character particularly usable in air conveying systems for heating and cooling, it is to be understood that the method of the invention may be utilized for applying expandable tubular jacketing material to other elongated bodies.

Referring to the drawings in detail, FIGS. **1** through **3** illustrate an apparatus or arrangement for the performance of method steps in applying expandable tubular jacketing material, such as an impervious organic film, onto substantially rigid tubular fibrous bodies or duct sections. The method is particularly usable for applying an impervious jacket of expandable organic film onto a tubular duct section **10,** preferably of fibrous material, having ship lap ends, one end **12** being a male end and the other a female end **14** as illustrated in FIGS. **2, 4** and **5.**

FIG. **5** illustrates the fibrous body or duct section **10** encased in a covering, jacket or film **16** applied to the body or duct section **10** through the use of the method and apparatus of the invention. The duct section **10,** as illustrated, is of circular cylindrical configuration and is fashioned of mineral fibers, for example, glass fibers, compressed to a density in a range of 2 to 16 pounds or more per cubic foot providing a tubular duct section of substantially rigid character, the fibers of the duct being bonded together by a suitable resin such as phenolformaldehyde.

It is to be understood that while a body or duct of circular cross section is illustrated, the method and apparatus may be utilized for applying jacketing or film material to bodies of other cross sectional configuration such as square, hexagonal or the like. The apparatus or arrangement is inclusive of a means, housing or enclosure **18** preferably of rectangular cross section providing a chamber **20** mounted upon support means or members **21.** In the embodiment illustrated, the closure or housing **18** comprises a floor or bottom wall **23,** a rear end wall **24,** a front end wall construction **25,** side walls **26** and a top or cover member **27.**

The enclosure **18** may be fabricated of wood, sheet metal or other suitable material. The top or cover member **27** in the embodiment illustrated is secured to

the side walls by screws **28** or other suitable means. The housing **18**, providing the chamber **20**, is substantially fluid tight or air tight in order that reduced pressure may be established in the chamber **20**. In the embodiment illustrated, a suction blower **30** is provided having a tubular portion **31** extending through an opening **32** in the floor or bottom wall **23**. The suction blower is of conventional construction and is driven by an electrically energizable motor **33**.

Operation of the suction blower **30** exhausts air from the chamber **20** through the tubular portion **31** to establish subatmospheric or reduced pressure in the chamber **20**. The end construction **25** for the forward end of the enclosure **18** includes a member **36** which has an opening **37**. An end plate or member **38** is secured to the end member **36** by screws **39** or other suitable means. A sealing gasket **41** is disposed between the plate **39** and the housing end member **36** to form an air tight joint.

The end plate **38**, which is preferably of metal, is fashioned with an opening which accommodates a tubular guide means or member **43**. The portion of the member **43** within the chamber **20** is of foraminous construction having a plurality of openings or holes **45** as particularly shown in FIG. **2**. The portion **46** of the tubular member **43** exteriorly of the plate **38** is unperforated as shown in FIG. **1**. The plate **38** is welded or otherwise joined with the member **43** to form a fluid or air tight connection, the plate **38** supporting the tubular member **43**.

Support means is provided for mounting a supply roll **48** of the tubular jacketing or film material **16** in flattened condition for covering the tubular bodies or duct sections **10**. In the arrangement shown in FIGS. **1** and **2**, the supply roll is equipped with a shaft or mandrel **50**, the supply roll **48** being disposed interiorly of the chamber **20**. Disposed in the chamber **20** are upwardly extending members or support means **52** which may be secured to the side walls **26**. The upper end region of each of the members **52** is provided with a slot **54** adapted to receive the shaft **50**, the members **52** supporting the supply roll **48** of film material **16**.

Secured to the cover **27** by hinges or hinge members **58** is an access door or movable closure **56**, the hinged cover or closure **56** being preferably provided with a hand grip or knob **60** for manipulating the closure **56**. The provision of the access door or closure **56** enables the removal of the empty mandrel and the insertion of a supply roll of tubular jacketing or film material in flattened form. The housing **18** is preferably provided with means for venting the chamber to equalize the pressure in the chamber in order to effect a contraction of an expanded portion of film material withdrawn from the supply roll about a duct section or fibrous body.

The housing cover **27** may be fashioned with a vent opening **62** and a valve or closure **63** provided for the vent opening. The closure member **63** is pivoted for movement about a shaft or pin **64** to open and close the vent **62**. A manipulating knob or member **65** is secured to the valve or closure **63** for manipulating the closure. Disposed adjacent the open end of member **43** adjacent the plate **38** is a cradle or member **67** mounted on a support means **68**, the cradle being adapted to receive and support a jacketed body or duct section when the same is withdrawn from the tubular means or guide **43**.

The operation and functioning of the apparatus illustrated in FIGS. **1** through **3** in applying a jacket or film material to an elongated fibrous body or duct section is as follows: Assuming a start-up operation, the access door **56** is opened and a supply roll **48** of film or jacket material **16** is carried by a mandrel or shaft **50** is disposed with the end regions of the shaft **50** received in the slots **54** in the members **52**. With the access door **56** open, the operator then manually withdraws some of the film **16** from the supply roll **48** and inserts the film into the tubular member **43**.

The operator then closes the access door **56** and reaching in the open end of member **43** exteriorly of the chamber **20** grasps the film and withdraws it until the distal end of the film extends slightly beyond the distal end of the portion **46**. The operator then folds a short length of the film **16** over the exterior end region of portion **46**, the folded portion of the film indicated at **70**. The folding of film material at the region **70** establishes a snug sealing engagement between the folded region **70** of the film and the end region **46** of the member **43**.

It is found that ordinarily a seal is established between the folded portion **70** and the portion **46** but, if desired, a securing collar or member **72** having a tapered interior configuration **73** may be telescoped over the folded end region **70** of the film to assure a sealing engagement. With the member **63** in a position closing the vent opening **62**, the suction blower motor **33** is energized whereby the suction blower **30** exhausts air from the interior of chamber **20** establishing a reduced pressure or partial vacuum in the chamber **20**.

As the end region **70** of the film **16** is in sealing engagement with the end portion **46** of the member **43**, the atmospheric pressure existent in the interior of the withdrawn portion of the film or jacketing material **16** is effective to expand the withdrawn portion into snug engagement with the interior surface area of the perforated guide member **43**, the withdrawn portion of the film being limited in its expansion by the member **43**. The operator then telescopes a fibrous body or duct section **10** into the expanded tubular film until the outer end of the duct section **10** is substantially within the portion **46**.

The operator may then vent the chamber **20** to equalize or normalize the pressure in chamber **20** approaching atmospheric pressure by either of two methods, by opening the member **63** so that the chamber **20** is vented to the atmosphere through the vent openings **62**, or by removing the collar **72** if the same is used, and unfolding the portion **70** and manually breaking the seal by pulling the unfolded portion out of engagement with the portion **46** of the tubular member **43** to permit atmospheric air to flow in between the film material **16** and the perforated region of the member **43** so that air flow through the perforations **45** substantially equalizes or normalizes the reduced pressure in the chamber **20**.

Upon the equalization or increase in pressure in the chamber **20**, the portion of the film material **16** withdrawn from the supply and surrounding the duct section or body **10** is contracted into snug contiguous engagement with the exterior of the fibrous body or duct section **10**. The operator then withdraws the jacketed or film-covered body or duct section from the tubular member **43** into the cradle **67** until the inner end of the body or duct section is beyond the unperforated end portion **46** of the member **43**. The end region of the film material **16** is then severed by a severing instrumentality **75** such as an electrically heated implement

by fusing the film or the film may be severed by a cutting implement or other suitable severing means.

The fibrous body or duct encased within the jacketing material or film **16** is illustrated in FIG. **5**, the end regions **70** of the film extending beyond the ends of the body or duct section being folded inwardly, as shown in FIG. **5**. The operation of withdrawing the film-encased duct from the tubular member **43** effects a withdrawal of an additional portion of the jacket or film material **16** from the supply roll **48**, the withdrawn portion being slightly longer than the tube **43**.

When the film adjacent the end of the film-encased duct is severed by the severing instrumentality **75**, the amount of film material equal to the folded portion **70** extends beyond the end of the portion **46** of the tube **43**. After severing the film, the portion **70** of the withdrawn film is folded into the position illustrated in FIG. **2** so that a seal is established at the region of the folded portion **70** with the portion **46** of the tube **43**. As the chamber **20** is vented through the perforations or openings **45** during the withdrawal of a jacketed or film-encased body or duct section, the chamber **20** approaches atmospheric pressure even though the suction blower **30** is still in operation.

When the operator folds the end region **70** of the film into the configuration shown in FIG. **2**, a seal is established at this region preventing further flow of atmospheric air in the peripheral region between the withdrawn portion of the film **16** and the tube **43** and the withdrawn portion of the film or jacketing material **16** is expanded by reason of the differential or reduced pressure in the chamber **20** and the atmospheric pressure existent within the withdrawn portion of the film or jacket material.

The operator then repeats the above-described cycle of operations but without having to initially manually insert the film material from the roll **48** as the withdrawal of the film-encased or jacketed duct effects the withdrawing of the film material as a casing or jacket for the succeeding duct section to be inserted in the expanded withdrawn portion of the film material.

The expandable film material may be a vinyl film such as a film of vinyl chloride-acetate copolymer or a polyvinyl chloride. A vinyl film is preferred but a film of polyethylene or chloropolyethylene or other suitable expandable resinous plastic material may be used as a jacket or casing material for the fibrous body or duct sections.

In reference to the method of venting the chamber **20** in order to contract the withdrawn film into snug engagement with the fibrous body or duct section, it has been pointed out that the seal may be broken by unfolding the film portion **70** or by opening the vent or vent closure or valve **63**. The reduced pressure in the chamber may be normalized by deenergizing the blower motor **33** whereby the chamber **20** would be vented through the air entrance of the suction blower.

The arrangement of the removable plate **38** and tube **43** welded or otherwise joined with the plate renders the apparatus usable for jacketing or encasing fibrous bodies or duct sections of different diameters. By employing an assembly of a tube **43** of different diameter welded or joined with a plate **38**, an assembly of the tube **43** and plate **38** may be removed by removing the screws **39** and replaced by an assembly of a tube **43** of different diameter welded or joined to a different plate **38**. The opening **37** in the end wall **36** is of larger diameter than the largest tube **43** that may be employed with the apparatus so that tubes **43** of various diameters may be employed without any other change being made in the apparatus.

FIGS. **6** and **7** illustrate a modified form of apparatus for performing the method steps of the invention. In this form a means is provided for supporting the supply roll of jacketing or film material outside of the housing or chamber in which the body or duct encasing operations are performed, the arrangement including sealing means at the region of feeding the jacketing or film material into the interior of a foraminous tubular means or member in the chamber. The arrangement shown in FIGS. **6** and **7** is inclusive of an elongated cylindrically shaped housing **80** fashioned of metal or other material having a rear end wall **82** and an outwardly extending flange **83** adjacent the other end of the housing.

The housing **80** is mounted upon suitable support means or supports **84** and **85** adjacent the respective ends of the housing. A suction blower **30'** has a tubular portion **31'** extending into an opening **32'** in the wall of the housing **80**, the suction blower being employed for exhausting air from the chamber **87** provided by the housing, the blower being driven by an electrically energizable motor **33'**. A plate **89** providing a forward end wall for the housing **80** is secured to the flange **83** by removable screws **90**, a sealing gasket **92** being disposed between the flange **83** and the plate **89**.

The plate **89** is provided with an opening receiving an end region of a tube or tubular member **94**, the plate being welded or otherwise secured to an unperforated portion **95** of the tube **94** extending a short distance through the opening in the plate **89**. The portion of the tube **94** disposed within the chamber **87** is provided with a large number of perforations, openings or orifices **97** as illustrated in FIG. **6**. In the arrangement shown in FIG. **6**, the tubular member or tube **94** extends full length of the chamber **87**, the end of the tube **94** adjacent the end wall **82** engaging a sealing gasket **98** disposed between the end of the tube and the end wall **82**.

The housing **80** may be provided with vent means for venting the chamber **87** to contract a withdrawn portion of film material onto a fibrous body or duct section. Secured to the housing **80** and opening into the chamber **87** is a tubular means or pipe **100** equipped with a manually operable slide valve means or movable closure **102** of conventional construction for closing or opening the passage in the tubular means or pipe **100**, the pipe being vented to the atmosphere.

Means is disposed adjacent the housing **80** for supporting a supply of tubular jacketing or film material. Disposed adjacent the housing support **84** is a support means comprising two transversely-spaced upwardly-extending members **104**, one of which is shown in FIG. **6**, the upper end of each of the members **104** being provided with a slot **106**, the slots receiving a shaft **50'** which mounts a supply roll **48'** of tubular plastic film material **16'**. The tubular material **16'** in the roll is in flattened condition.

The end wall **82** of the housing **80** is provided with an opening **108** defined by a rectangularly-shaped portion **110** projecting rearwardly of the wall **82**. Disposed in the open region **108** is a pair of rolls **112**, each roll being mounted upon a shaft **114** journaled for rotation in openings in the side walls **115** of the rectangular projecting portion **110**. The rolls **112** are preferably fash-

ioned of resilient material such as semihard rubber or resilient plastic or resinous material, the tubular film material **16'** in flattened condition being advanced between the rolls **112.**

Through the utilization of rolls **112** of rubber-like or resilient material, the regions of the rolls at each side of the tubular flattened film **16'** are in engagement thereby providing a seal adjacent each edge region of the flattened film material. Secured to the end region of the rectangular projection **110** is a member **118** having a rectangular opening **120** to admit the passage of the film material **16'** to the rolls. The member **118** is of flexible material, such as thin sheet metal, flexible plastic material or the like whereby portions **121** of the flexible member **118** are configurated to have wiping contact or engagement with the surfaces of the rolls **112** to provide a sealing means.

The operation and functioning of the form of apparatus illustrated in FIGS. **6** and **7** in applying jacket or film material to elongated fibrous bodies or duct sections are substantially the same as the operation and functioning of the apparatus illustrated in FIGS. **1** through **3.** At a start-up operation, the operator manually feeds the tubular flattened film material **16'** through the sealing rolls **112** and draws the film material lengthwise through the tube **94** and folds the end portion **70'** over the end region of the unperforated portion **95** of the tube **94** to establish a seal between the end region of the film and the portion **95.**

If desired, a collar **72'** may be engaged with the folded portion **70'** as shown in FIG. **6** to assure a sealing engagement of the film material with the tubular portion **95.** The slide valve or member **102** is moved to a position closing the vent tube **100.** The suction blower **30'** is energized and air exhausted from the interior of the chamber **87** establishing a reduced pressure or partial vacuum in the chamber **87.**

As the end region **70'** of the film **16'** is in sealing engagement with the tubular portion **95,** the atmospheric pressure existent in the interior of the withdrawn portion of the film or jacketing material **16'** is effective to expand the withdrawn portion into snug engagement with the interior surface area of the perforated tube or tubular means **94** as illustrated in FIG. **6,** the tube **94** limiting the amount of expansion of the withdrawn portion of the film **16'.**

With the film material **16'** expanded or stretched to the extent limited by the tube **94,** the operator telescopes or inserts a fibrous body or duct section **10'** into the expanded tubular film until the outer end of the body or duct is adjacent the portion **95** so that when the portion **70'** of the film material is unfolded, it will overlie the end of the body or duct section. The operator then vents the chamber **87** to substantially equalize or normalize the pressure in the chamber **87** approaching atmospheric pressure.

The venting of the chamber may be accomplished by de-energizing the blower motor **33'**, or by opening the slide valve **102** so that the chamber is vented through the tube **100,** or the chamber vented by removing the collar **72'** if the same is used, and unfolding the portion **70'**, the operator then manually breaking the seal by pulling the unfolded portion to disengage the film **16'** from the unperforated portion **95** permitting atmospheric air to flow between the film material **16'** and the perforated region of the member **94** and through the perforations **97** to substantially equalize or normalize the pressure in the chamber **87.**

Upon the equalization or increase in pressure in the chamber **87,** the portion of the film material **16'**, withdrawn from the supply and surrounding the duct section or body **10,** is contracted into snug, contiguous or intimate engagement with the exterior of the body or duct section **10'**. The operator then withdraws the jacketed or film-encased body or duct section from the tubular member **4** as hereinbefore described in reference to the operation of the apparatus shown in FIGS. **1** through **3,** and the film severed to provide a small length of film for folding over the end of the duct in the manner illustrated in FIG. **5.**

The operation of withdrawing the film-encased duct **10'** from the tubular member **94** simultaneously effects a withdrawal of an additional portion of the jacket or film material **16'** from the supply roll **48'**, the withdrawn portion of the film being slightly longer than the tube **94** and its unperforated portion **95.** The cycle of operations or method steps is then repeated in applying a jacket or tubular film to a succeeding fibrous body or duct section.

It is apparent that, within the scope of the invention, modifications and different arrangements may be made other than as herein disclosed, and the present disclosure is illustrative merely, the invention comprehending all variations thereof.

We claim:

1. The method of encasing an elongated tubular body with expandable tubular jacketing material including withdrawing from a supply a portion of the tubular material in a chamber, establishing reduced pressure in the chamber exteriorly of the withdrawn portion of the tubular material to expand the withdrawn portion, inserting the tubular body lengthwise into the expanded withdrawn portion of the material, and increasing the pressure in the chamber contracting the withdrawn portion of the material into intimate engagement with the periphery of the body.

2. The method according to claim **1** including the steps of moving the jacket-encased body lengthwise out of the chamber thereby withdrawing a portion of the film from the supply, and severing the jacket encasing the fibrous body from the portion withdrawn from the supply by the lengthwise movement of the jacket-encased body.

3. The method of encasing a tubular fibrous body with an expandable tubular film including withdrawing from a supply a portion of tubular film in a chamber, establishing reduced pressure in the chamber exteriorly of the withdrawn portion of the tubular film to expand the portion, limiting the expansion of the tubular film, inserting the tubular fibrous body lengthwise into the expanded tubular withdrawn portion, and increasing the pressure in the chamber contracting the withdrawn portion of the film into intimate engagement with the periphery of the fibrous body.

4. The method of encasing a tubular fibrous body with an expandable tubular film including withdrawing from a supply a portion of tubular film in a chamber, exhausting air from the chamber establishing a partial vacuum in the chamber exteriorly of the withdrawn portion of the tubular film to expand the withdrawn portion, limiting the expansion of the withdrawn portion, inserting the tubular fibrous body lengthwise into the expanded tubular withdrawn portion, and venting

the chamber contracting the withdrawn portion of the film into intimate engagement with the periphery of the fibrous body.

5. The method of encasing an elongated tubular body with an expandable tubular film including advancing tubular film lengthwise in a walled chamber from a supply of the tubular film in flattened condition, establishing a seal of the open end region of the film with the chamber at the region of an opening in the chamber wall, establishing reduced pressure in the interior of the chamber to expand the portion of the tubular film advanced from the supply, limiting the expansion of the tubular film, inserting the tubular body through the open end of the tubular film into the expanded tubular film, and increasing the pressure in the chamber to contract the film into intimate engagement with the periphery of the tubular body.

6. The method according to claim 5 including the steps of moving the film-encased fibrous body lengthwise out of the chamber and thereby withdrawing a portion of the film from the supply, and severing the film encasing the fibrous body from the portion withdrawn from the supply by the lengthwise movement of the film-encased body.

7. The method of encasing a tubular fibrous body with an expandable tubular film including advancing tubular film lengthwise in a chamber and through an opening in the chamber wall from a supply roll of the film, establishing a fluid-tight seal of the open end region of the film with the chamber adjacent the opening, exhausting air from the interior of the chamber to expand the portion of the tubular film to an enlarged cross sectional area, inserting the fibrous body lengthwise into the expanded film, increasing the pressure in the chamber to contract the film into intimate engagement with the periphery of the fibrous body, withdrawing the film-encased body from the chamber, and severing the film adjacent the end region of the body.

8. The method of encasing a tubular fibrous body with an expandable tubular film including withdrawing tubular film lengthwise in a chamber from a supply roll of the film and through an opening in the chamber wall, establishing a seal of the open end region of the film with the chamber adjacent the opening, exhausting air from the interior of the chamber to expand the withdrawn portion of the tubular film, inserting the fibrous body lengthwise into the expanded film, increasing the pressure in the chamber to contract the film into intimate engagement with the periphery of the fibrous body, removing the film-encased body from the chamber, and severing the film adjacent the end region of the removed body.

9. The method of encasing a tubular fibrous body with an expandable tubular film including withdrawing tubular film lengthwise in a walled chamber from a supply roll exteriorly of the chamber, establishing a seal of the open end region of the film with the chamber adjacent an opening in a wall of the chamber, exhausting air from the interior of the chamber to expand the withdrawn portion of the tubular film, inserting the fibrous body lengthwise into the expanded film, increasing the pressure in the chamber to contract the film into intimate engagement with the periphery of the fibrous body, moving the film-encased body lengthwise out of the chamber and thereby withdrawing a portion of the film from the supply roll into the chamber, and severing the film from the supply adjacent the end region of the film-encased body.

10. Apparatus of the character disclosed, in combination, means providing a chamber, means supporting a supply of expandable tubular jacketing material, a tubular foraminous member disposed in said chamber and terminating adjacent an opening in a wall of the chamber, said tubular member adapted to receive jacketing material withdrawn from the supply, and means effecting varying pressures in the chamber to expand the withdrawn portion of the jacketing material to receive a body to be encased in the jacketing material and to contract the jacketing material about the body.

11. The apparatus according to claim 10 including means for severing the jacketing material adjacent an end of the encased body after the encased body is withdrawn from the tubular member.

12. Apparatus of the character disclosed, in combination, means providing a chamber, means supporting a supply of expandable tubular jacketing material, a tubular foraminous member disposed in said chamber, said tubular member adapted to receive jacketing material withdrawn from the supply, means establishing differential pressure in the chamber effective to expand the withdrawn tubular jacketing material to receive a body within the expanded material, and means reducing the effectiveness of the differential pressure to contract the jacketing material into encasing engagement with the body.

13. Apparatus of the character disclosed, in combination, means providing a walled chamber, means supporting a supply of expandable tubular jacketing material in flattened condition, a plate providing an end wall of the chamber, tubular means disposed in the chamber and extending through an opening in the plate, the wall region of the tubular means within the chamber having a plurality of openings therein, said tubular means adapted to receive jacketing material withdrawn from the supply, means for establishing reduced pressure in the chamber to expand the withdrawn tubular jacketing material into engagement with the interior surface of the tubular means whereby a body may be inserted within the expanded material, means effective to normalize the pressure in the chamber to contract the jacketing material into encasing engagement with the body, and means for severing the jacketing material from the supply at a region adjacent the end of the jacketed body after the same is withdrawn from the tubular means.

14. The combination according to claim 13 including removable means for securing the plate to the chamber whereby to accommodate plates equipped with tubular means of different sizes for applying jacketing material to bodies of different sizes.

15. Apparatus of the character disclosed, in combination, a housing providing a chamber, a supply of expandable tubular jacketing material disposed exteriorly of the chamber, a rear wall of said housing having an opening through which the tubular jacketing material is advanced from the supply into the chamber, sealing means engaging the jacketing material to seal the entrance in the chamber at the region of the jacketing material, a tubular member in the chamber adapted to receive the tubular jacketing material, said tubular member terminating adjacent an opening in the front wall of the chamber, said tubular member being sealingly engaged with the front wall, said tubular member having

a perforated wall, means for exhausting air from the chamber to expand the jacketing material within the tubular member to receive a body to be encased in the jacketing material, and means effective to normalize the pressure in the chamber to contract the jacketing material about the periphery of the body.

16. The combination according to claim **15** wherein the sealing means adjacent the entrance of the jacketing material into the housing comprises rolls engaging the jacketing material, and means mounted by the housing in sealing engagement with the rolls.

17. The combination according to claim **15** including means for venting the chamber, and movable valve means for opening and closing the venting means.

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