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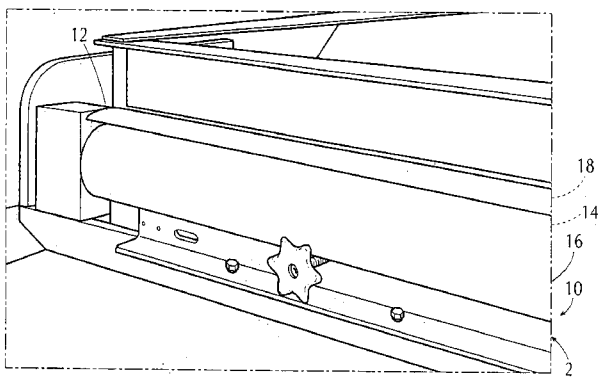
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(54) Title: DEVICE FOR PREVENTING JAMMING OF A FIBROUS MATERIAL SUBJECT TO A COMPRESSIVE TREATMENT IN A STUFFING CHAMBER DEFINED BY A FEED ROLL AND A RETARD ROLL

FIG. 1



(57) Abstract: A device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll. The device includes an impact blade and a stabilizing apparatus. The impact blade is rigid and interchangeable. The stabilizing apparatus stabilizes the impact blade against moving away from the feed roll to prevent the jamming of the fibrous material between the feed roll and the impact blade during the compressive treatment of the fibrous material.

DEVICE FOR PREVENTING JAMMING OF A FIBROUS MATERIAL SUBJECT TO A COMPRESSIVE TREATMENT IN A STUFFING CHAMBER DEFINED BY A FEED ROLL AND A RETARD ROLL

1. Background of the invention.

A. Field of the invention.

The embodiments of the present invention relate to a device for a compressive treatment of a fibrous material, and more particularly, the embodiments of the present invention relate to a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll.

B. Description of the prior art.

Where greater shrinkage control is required, the fabric must be compacted to a greater amount in the stuffing chamber formed between the moving surfaces and the confining apparatus. Under high fabric compression forces, the fabric tends to be forced into the nip area between the moving surfaces instead of around the apex of the confining apparatus with the result that the fabric will not flow at a relatively fast speed into the chamber and at a slower speed out of the chamber. In order to prevent this from occurring, applicant includes an impact blade that is rigidly positioned between the rolls.

Impact blade adjustment apparatus moves the impact blade towards or away from the confining apparatus in order to regulate the size of the stuffing chamber for thick or thin fabrics. It has been discovered, however, that due to the length and movement of the impact blade, as discussed above, the impact blade has a tendency to move laterally away from the feed roll allowing the fabric to jam between the feed roll and the blade.

Thus, there exists a need to prevent the impact blade from moving laterally so as not to cause jamming.

Numerous innovations for apparatuses for compressing a web of fibrous material have been provided in the prior art, which will be described below in chronological order to show advancement in the art, and which are incorporated herein by reference thereto. Even though these innovations may be suitable for the individual purposes to which they address, nevertheless, they differ from the embodiments of the present invention in that they do not teach a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll.

(1) ***United States Patent Number 4,363,161 to Catallo.***

United States Patent Number 4,363,161 issued to Catallo on December 14, 1982 in U.S. class 26 and subclass 18.6 teaches an apparatus for compressing a web of fibrous material, which includes a first surface movable in one direction, and a second surface movable in an opposite direction and at a speed slower than the speed of movement of the first surface. A confining apparatus having an apex extends between the first and second surfaces. A stuffing chamber is formed between the first and second surfaces and the confining apparatus. Movement of the first surface feeds a web of material into the stuffing chamber, and movement of the second surface moves compressed material out of the stuffing chamber. A method of compressing a web of fibrous material, wherein the material is forced into a stuffing chamber formed between a confining apparatus having an

apex and two surfaces is further taught. A web of material is fed into the stuffing chamber by moving one of the surfaces in one direction at a particular speed. Compressed material is removed from the stuffing chamber by moving the second surface in a direction opposite to that of the first surface and at a slower speed than that of the first surface.

(2) ***United States Patent Number 4,447,938 to Catallo.***

United States Patent Number 4,447,938 issued to Catallo on May 15, 1984 in U.S. class 26 and subclass 18.6 teaches an apparatus for compressing a web of fibrous material, which includes a first surface movable in one direction, and a second surface movable in an opposite direction and at a speed slower than the speed of movement of the first surface. A confining apparatus having an apex extends between the first and second surfaces. A stuffing chamber is formed between the first and second surfaces and the confining apparatus. Movement of the first surface feeds a web of material into the stuffing chamber, and movement of the second surface moves compressed material out of the stuffing chamber. A method of compressing a web of fibrous material, wherein the material is forced into a stuffing chamber formed between a confining apparatus having an apex and two surfaces is further taught. A web of material is fed into the stuffing chamber by moving one of the surfaces in one direction at a particular speed. Compressed material is removed from the stuffing chamber by moving the second surface in a direction opposite to that of the first surface and at a slower speed than that of the first surface.

It is apparent that numerous innovations for apparatuses for compressing a web of fibrous material have been provided in the prior art, which are adapted to be used. Furthermore, even though these innovations may be suitable for the individual purposes to which they address, nevertheless, they would not be suitable for the purposes of the embodiments of the present invention as heretofore described, namely, a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll.

2. Summary of the invention.

Thus, an object of the embodiments of the present invention is to provide a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll, which avoids the disadvantages of the prior art.

Briefly stated, another object of the embodiments of the present invention is to provide a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll. The device includes an impact blade and a stabilizing apparatus. The impact blade is rigid and replaceable. The stabilizing apparatus stabilizes the impact blade against moving away from the feed roll to prevent the jamming of the fibrous material between the feed roll and the impact blade during the compressive treatment of the fibrous material.

The novel features considered characteristic of the embodiments of the present invention are set forth in the appended claims. The embodiments of the present invention themselves, however, both as to their construction and their method of operation together with additional objects and advantages thereof will be best understood from the following description of the specific embodiments when read and understood in connection with the accompanying drawing.

3. Brief description of the drawing.

The figures of the drawing are briefly described as follows:

FIGURE 1 is a diagrammatic perspective view of the device of the embodiments of the present invention preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll;

FIGURE 2 is an enlarged diagrammatic perspective view of the device of the embodiments of the present invention identified by **ARROW 2** in **FIGURE 1**; and

FIGURE 3 is an exploded reduced diagrammatic perspective view of the device of the embodiments of the present invention shown in **FIGURE 2**.

4. List of reference numerals utilized in the drawing.

A. General.

10 device of embodiments of present invention for preventing jamming of fibrous material **12** subject to compressive treatment in stuffing chamber **14** defined by feed roll **16** and retard roll **18**

12 fibrous material

14 stuffing chamber

16 feed roll of stuffing chamber **14**

18 retard roll of stuffing chamber **14**

B. Overall configuration of device 10.

20 impact blade

22 stabilizing apparatus to prevent jamming of fibrous material **12** between feed roll **16** and impact blade **20** of stuffing chamber **14** during compressive treatment of fibrous material **12**

C. Specific configuration of impact blade 20 and stabilizing apparatus 22.

(1) *Impact blade 20.*

24 upper extreme of impact blade **20**

26 lower extreme of impact blade **20**

28 pair of sides of impact blade **20**

30 pair of free ends of impact blade **20**

32 pair of notches of upper extreme **24** of impact blade **20**

34 pair of through bores of impact blade **20**

36 pair of end pins of impact blade **20**

38 center pin of impact blade **20**

40 impact blade hook hand tool of impact blade **20**

42 short portion of impact blade hook hand tool **40** of impact blade **20**

44 long portion of impact blade hook hand tool **40** of impact blade **20**

46 free end of long portion **44** of impact blade hook hand tool **40** of impact blade **20**

48 pin of free end **46** of long portion **44** of impact blade hook hand tool **40** of impact blade **20**

(2) ***Stabilizing apparatus 22.***

49 base support of stabilizing apparatus **22**

50 four pair of secondary through bores of transverse portion **53** of base support **49** of stabilizing apparatus **22**

51 pair of free ends of base support **49** of stabilizing apparatus **22**

52 mounting plate of stabilizing apparatus **22**

53 transverse portion of base support **49** of stabilizing apparatus **22**

54 blade holder body of stabilizing apparatus **22**

55 pair of upright portions of base support **49** of stabilizing apparatus **22**

55a pair of free ends of blade holder body **54** of stabilizing apparatus **22**

56 transverse portion of blade holder body **54** of stabilizing apparatus **22**

57 pair of primary through bores of transverse portion **53** of base support **49** of stabilizing apparatus **22**

58 upright portion of blade holder body **54** of stabilizing apparatus **22**

60 pair of end through slots of blade holder body **54** of stabilizing apparatus **22**

61 pair of primary through bores of upright portion **58** of blade holder body **54** of stabilizing apparatus **22**

62 blade rest of blade holder body **54** of stabilizing apparatus **22**

63 center through slot of upright portion **58** of blade holder body **54** of stabilizing apparatus **22**

64 blade clamp stiffener of stabilizing apparatus **22**

66 side of blade clamp stiffener **64** of stabilizing apparatus **22**

68 pair of bores of side **66** of blade clamp stiffener **64** of stabilizing apparatus **22**

70 pair of hand knobs of stabilizing apparatus **22**

D. Specific configuration of impact blade leveling assembly 72.

72 impact blade leveling assembly

74 three block shaft supports of impact blade leveling assembly **72**

76 central through bore through each block shaft support of three block shaft supports **74** of impact blade leveling assembly **72**

1	**78**	pair of upper bores of each block shaft support of three block shaft supports **74** of
2		impact blade leveling assembly **72**
3	**80**	screw of impact blade leveling assembly **72**
4	**82**	lock washer of impact blade leveling assembly **72**
5	**84**	flat washer of impact blade leveling assembly **72**
6	**86**	jack shaft of impact blade leveling assembly **72**
7	**88**	slotted proximal end of jack shaft **86** of impact blade leveling assembly **72**
8	**90**	distal end of jack shaft **86** of impact blade leveling assembly **72**
9	**91**	three flange bearings of impact blade leveling assembly **72**
10	**92**	coupling of impact blade leveling assembly **72**
11	**94**	one end of coupling **92** of impact blade leveling assembly **72**
12	**96**	other end of coupling **92** of impact blade leveling assembly **72**
13	**97**	one end of shaft **98** of impact blade leveling assembly **72**
14	**98**	shaft of impact blade leveling assembly **72**
15	**100**	bearing block of impact blade leveling assembly **72**
16	**101**	stationary structure
17	**102**	pair of screws of bearing block **100** of impact blade leveling assembly **72**
18	**104**	two pair of flat washers of bearing block **100** of impact blade leveling assembly **72**
19	**106**	two pair of nuts of bearing block **100** of impact blade leveling assembly **72**
20	**108**	axial through bore of bearing block **100** of impact blade leveling assembly **72**
21	**109**	other end of shaft **98** of impact blade leveling assembly **72**

110 hand wheel of impact blade leveling assembly **72**

112 indicator of hand wheel **110** of impact blade leveling assembly **72**

114 pair of collinearly aligned springs of impact blade leveling assembly **72**

116 clamp-on collar of impact blade leveling assembly **72**

118 pair of drive miter gears of impact blade leveling assembly **72**

120 clamp-on collar of each drive miter gear of pair of drive miter gears **118** of impact blade leveling assembly **72**

121 pair of jacking screws of impact blade leveling assembly **72**

122 wide lower end of each jacking screw of pair of jacking screws **121** of impact blade leveling assembly **72**

124 thin threaded upper end of each jacking screw of pair of jacking screws **121** of impact blade leveling assembly **72**

126 flange of each jacking screw of pair of jacking screws **121** of impact blade leveling assembly **72**

128 pair of driven miter gears of impact blade leveling assembly **72**

130 bronze bushing of impact blade leveling assembly **72**

132 snap ring of impact blade leveling assembly **72**

134 pair of bar nuts of impact blade leveling assembly **72**

136 threaded central through bore of each bar nut of pair of bar nuts **134** of impact blade leveling assembly **72**

137 pair of secondary through slot of blade holder body **54** of stabilizing apparatus **22**

E. Specific configuration of blade/feed roll adjusting assembly 138.

138 blade/feed roll adjusting assembly

140 pair of end braces of blade/feed roll adjusting assembly **138**

142 two pair of screws of blade/feed roll adjusting assembly **138**

144 two pair of washers of blade/feed roll adjusting assembly **138**

146 pair of spacers of blade/feed roll adjusting assembly **138**

148 pair of pivot plates of blade/feed roll adjusting assembly **138**

150 pair of screws of blade/feed roll adjusting assembly **138**

152 pair of spreader bearings of blade/feed roll adjusting assembly **138**

154 pair of stud/screw combinations of blade/feed roll adjusting assembly **138**

156 pair of hand knobs of blade/feed roll adjusting assembly **138**

158 pair of anchor mounts of blade/feed roll adjusting assembly **138**

160 pair of collars of blade/feed roll adjusting assembly **138**

162 pair of mounting blocks of blade/feed roll adjusting assembly **138**

166 pair of screws of blade/feed roll adjusting assembly **138**

168 pair of washers of blade/feed roll adjusting assembly **138**

170 pair of ball plunger stubs of blade/feed roll adjusting assembly **138**

172 through bore in each mounting block of pair of mounting blocks **162** of blade/feed roll adjusting assembly **138**

5. Detailed description of the preferred embodiments.

A. General.

Referring now to the figures, in which like numerals indicate like parts, and particularly to **FIGURE 1**, which is a diagrammatic perspective view of the device of the embodiments of the present invention preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll, the device of the embodiments of the present invention is shown generally at **10** for preventing jamming of a fibrous material **12** subject to a compressive treatment in a stuffing chamber **14** defined by a feed roll **16** and a retard roll **18**.

B. The overall configuration of the device 10.

The overall configuration of the device **10** can best be sen in **FIGURE 2**, which is an enlarged diagrammatic perspective view of the device of the embodiments of the present invention identified by **ARROW 2** in **FIGURE 1**, and as such, will be discussed with reference thereto.

The device **10** comprises an impact blade **20** and a stabilizing apparatus **22**. The impact blade **20** is rigid and interchangeable. The stabilizing apparatus **22** stabilizes the impact blade **20** against moving away from the feed roll **16** to prevent the jamming of the fibrous material **12** between the feed roll **16** and the impact blade **20** during the compressive treatment of the fibrous material **12**.

C. The specific configuration of the impact blade 20 and the stabilizing apparatus 22.

The specific configuration of the impact blade **20** and the stabilizing apparatus **22** can best be seen in **FIGURE 3**, which is an exploded reduced diagrammatic perspective view of the device of the embodiments of the present invention shown in **FIGURE 2**, and as such, will be discussed with reference thereto.

(1) ***The impact blade 20.***

The impact blade **20** is thin, elongated, interchangeable for fibrous material **12** of different weights, generally flat, and has an upper extreme **24**, a lower extreme **26**, a pair of sides **28**, and a pair of free ends **30**.

The upper extreme **24** of the impact blade **20** has a pair of notches **32**. Each notch **32** of the impact blade **20** extends from a respective free end **30** of the impact blade **20** to a short distance inward therefrom.

The impact blade **20** further has a pair of through bores **34**. Each through bore **34** of the impact blade **20** extends laterally through the pair of sides **28** of the impact blade **20**, below a respective notch **32** of the impact blade **20**, and in proximity to a respective free end **30** of the impact blade **20**.

The impact blade **20** further has a pair of end pins **36**. Each end pin **36** of the impact blade **20** extends outward from one side **28** of the impact blade **20**, in proximity to a respective notch **32** of the impact blade **20**.

The impact blade **20** further has a center pin **38**. The center pin **38** of the impact blade **20** extends outward from the one side **28** of the impact blade **20**, between the pair of end pins **36** of the impact blade **20**.

The impact blade **20** further has an impact blade hook hand tool **40**. The impact blade hook hand tool **40** is L-shaped, and as such, has a short portion **42** and a long portion **44**. The long portion **44** of the impact blade hook hand tool **40** is longer than the short portion **42** of the impact blade hook hand tool **40**, and has a free end **46**. The free end **46** of the long portion **44** of the impact blade hook hand tool **40** has a pin **48** thereon. The pin **48** of the impact blade hook hand tool **40** replaceably engages in a respective through bore **34** of the impact blade **20** so as to allow removal of the impact blade **20** from the stabilizing apparatus **22** by manually lifting the impact blade **20**, via the impact blade hook hand tool **40**, from the stabilizing apparatus **22**, and so as to allow insertion of the impact blade **20** into the stabilizing apparatus **22** by manually lowering the impact blade **20**, via the impact blade hook hand tool **40**, into the stabilizing apparatus **22**.

(2) ***The stabilizing apparatus 22.***

The stabilizing apparatus **22** comprises a base support **49**. The base support **49** is elongated, has a pair of free ends **51**, and is generally inverted U-shaped, and has such, has a transverse portion **53** and a pair of upright portions **55**.

The transverse portion **53** of the base support **49** has a pair of primary through bores **57**. Each primary through bore **57** of the transverse portion **53** of the base support **49** is disposed in proximity to a respective free end **51** of the base support **49**.

The transverse portion **53** of the base support **49** further has four pair of secondary through bores **50**. Each two pair of secondary through bores **50** of the transverse portion **53** of the base support **49** straddle a respective primary through bore **57** of the transverse portion **53** of the base support **49**.

The stabilizing apparatus **22** further comprises a mounting plate **52**. The mounting plate **52** is flat, elongated, disposed above the transverse portion **53** of the base support **49**, and lies between the pair of primary through bores **57** of the transverse portion **53** of the base support **49**.

The stabilizing apparatus **22** further comprises a blade holder body **54**. The blade holder body **54** has a pair of free ends **55a**, is elongated, and generally L-shaped, and as such, has a transverse portion **56** and an upright portion **58**.

The upright portion **58** of the blade holder body **54** has a pair of end through slots **60**. Each end through slot **60** of the blade holder body **54** is axially disposed in proximity to a respective free end **55a** of the blade holder body **54**.

The upright portion **58** of the blade holder body **54** further has a pair of primary through bores **61**. Each primary through bore **61** of the upright portion **58** of the blade holder body **54** is disposed inward of a respective through slot **60** of the blade holder body **54**.

The upright portion **58** of the blade holder body **54** has a center through slot **63**. The center through slot **63** of the upright portion **58** of the blade holder body **54** is disposed between, and in line with, the pair of end through slots **60** of the blade holder body **54**.

The blade holder body **54** further has a blade rest **62**. The blade rest **62** of the blade holder body **54** is thin, elongated, and extends along the upright portion **58** of the blade holder body **54**, on a side thereof opposite to that of the transverse portion **56** of the blade holder body **54**, past the pair of free end **55a** of the blade holder body **54**, and below the pair of through slots **60** of the blade holder body **54** so as to allow the lower extreme **26** of the impact blade **20** to rest thereupon, while one side **28** of the impact blade **20** rests against the upright portion **58** of the blade holder body **54**, with the pair of end pins **36** of the impact blade **20** replaceably engaging in the pair of through slots **60** of the blade holder body **54**, respectively, and with the center pin **38** of the impact blade **20** replaceably engaging in the center through slot **63** of the upright portion **58** of the blade holder body **54**.

The stabilizing apparatus **22** further comprises a blade clamp stiffener **64**. The blade clamp stiffener **64** is thin, elongated, laterally-oriented, and disposed on a side **28** of the impact blade **20** opposite to that of the blade holder body **54** so as to allow the impact blade **20** to be captured between the blade clamp stiffener **64** and the blade holder body **54**.

The blade clamp stiffener **64** has a side **66** with a pair of bores **68**. The pair of bores **68** of the blade clamp stiffener **64** are threaded and in line with the pair of primary through bores **61** of the upright portion **58** of the blade holder body **54**, respectively.

The stabilizing apparatus **22** further comprises a pair of hand knobs **70**. Each hand knob **70** extends threadably into a respective primary through bore **61** of the upright portion **58** of the blade holder body **54**, and threadably into a respective bore **68** of the blade clamp stiffener **64**, and when tightened, securely captures and stabilizes the impact blade **20** between the blade holder body **54** and the blade clamp stiffener **64**.

D. The specific configuration of the impact blade leveling assembly 72.

The device **10** further comprises an impact blade leveling assembly **72**. The impact blade leveling assembly **72** levels the impact blade **20**.

The impact blade leveling assembly **72** comprises three block shaft supports **74**. The three block shaft supports **74** are substantially identical to each other, and has a central through bore **76** extending axially therethrough.

Each block shaft support **74** further has a pair of upper bores **78**. The three block shaft supports **74** depend in the base support **49**, with the pair of upper bores **78** of each block shaft support **74** aligned with a respective pair of secondary through bores **50** of the transverse portion **53** of the base support **49**, and with a screw **80** having a lock washer **82** and a flat washer **84** extending downwardly into a respective secondary through bore **50** of the transverse portion **53** of the base support **49** and threadably into a respective upper bore **78** of the three block shaft support **74** to thereby secure the three block shaft supports **74** to the base support **49**.

The impact blade leveling assembly **72** further comprises a jack shaft **86**. The jack shaft **86** has a slotted proximal end **88**, a distal end **90**, and extends rotatably through the central through bore **76** of each block shaft support **74** via three flange bearings **91**, respectively.

The impact blade leveling assembly **72** further comprises a coupling **92**. One end **94** of the coupling **92** receives the slotted proximal end **88** of the jack shaft **86**, while the other end **96** of the coupling **92** receives one end **97** of a shaft **98**.

The impact blade leveling assembly **72** further comprises a bearing block **100**. The bearing block **100** is stationarily affixed to a stationary structure **101** via a pair of screws **102**, two pair of flat washers **104**, and two pair of nuts **106**, and has an axial through bore **108** that rotatably receives the other end **109** of the shaft **98**.

The impact blade leveling assembly **72** further comprises a hand wheel **110**. The hand wheel **110** has an indicator **112** thereon, and fixedly receives the other end **109** of the shaft **98** so as to rotate therewith.

The impact blade leveling assembly **72** further comprises a pair of collinearly aligned springs **114**. The pair of collinearly aligned springs **114** receive the jack shaft **86**, and are maintained against an intermediate block shaft support **74** by a clamp-on collar **116**.

The impact blade leveling assembly **72** further comprises a pair of drive miter gears **118**. Each drive miter gear **118** fixedly receives the jack shaft **86**, and is disposed a

distance outboard of an associated block shaft support **74** determined by a clamp-on collar **120**.

The impact blade leveling assembly **72** further comprises a pair of jacking screws **120**. Each jacking screw **120** has a wide lower end **122** and a thin threaded upper end **124** that is thinner than, and separated from, the wide lower end **122** of a respective jacking screw **120** by a flange **126**.

The wide lower end **122** of each jacking screw **120** sits in a respective primary through bore **57** of the transverse portion **53** of the base support **49**, with the flange **126** of a respective jacking screw **120** preventing the respective jacking screw **120** from falling therethrough.

The impact blade leveling assembly **72** further comprises a pair of driven miter gears **128**. Each driven miter gear **128** fixedly receives the wide lower end **122** of a respective jacking screw **120**, with a bronze bushing **130** sitting in a respective primary through bore **57** of the transverse portion **53** of the base support **49**, and with each driven miter gear **128** being held on the wide lower end **122** of the respective jacking screw **120** by a snap ring **132**.

One drive miter gear **118** engages with an associated driven miter gear **128**, so when the hand wheel **110** is rotated, the jack shaft **86** rotates, which rotates the pair of drive miter gears **118**, which rotates the associated driven miter gear **128** engaged therewith, which rotates an associated jacking screw **120**.

Normally, the drive miter gear **118** closest to the hand wheel **110** is engaged with an associated driven miter gear **128** by virtue of biasing of the pair of collinearly aligned springs **114**, however, when the jack shaft **86** is pushed in via the hand wheel **110** against the biasing of the pair of collinearly aligned springs **114**, then the drive miter gear **118** closest to the hand wheel **110** is disengaged and the other drive miter gear **118** is engaged with an associated driven miter gear **128**.

The impact blade leveling assembly **72** further comprises a pair of bar nuts **134**. Each bar nut **134** fits into a respective secondary through slot **137** of the blade holder body **54** so as to allow the blade holder body **54** to move up and down therewith, and has a threaded central through bore **136** therein that receives the thin threaded upper end **124** of an associated jacking screw **120** so when a respective driven miter gear **128** is engaged and rotated, as previously discussed, the thin threaded upper end **124** of the associated jacking screw **120** rotates and threads an associated bar nut **134** up or down thereon, which in turn causes an associated free end **55a** of the blade holder body **54** to move up or down accordingly with the impact blade **20** affixed thereto, and thereby level the impact blade **20**.

E. The specific configuration of the blade/feed roll adjusting assembly 138.

The device **10** further comprises a blade/feed roll adjusting assembly **138**. The blade/feed roll adjusting assembly **138** adjustably spaces the impact blade **20** from the feed roll **16**.

The blade/feed roll adjusting assembly **138** comprises a pair of end braces **140**. Each end brace **140** extends upwardly from a respective free end **51** of the base support **49**, and is maintained fixedly thereat by a pair of screws **142** having washers **144** thereon and passing through a respective pair of secondary through bore **50** of the transverse portion **53** of the base support **49** and threadably into a respective end brace **140**.

The blade/feed roll adjusting assembly **138** further comprises a pair of spacers **146**. Each spacer **146** extends fixedly across a respective end brace **140**.

The blade/feed roll adjusting assembly **138** further comprises a pair of pivot plates **148**. Each pivot plate **148** is disposed on a respective end brace **140**, and is maintained thereat by a screw **150**.

The blade/feed roll adjusting assembly **138** further comprises a pair of spreader bearings **152**. Each spreader bearing **152** is attached to a respective pivot plate **148** by a stud/screw combination **154**.

The blade/feed roll adjusting assembly **138** further comprises a pair of hand knobs **156**. Each hand knob **156** extends into a respective anchor mount **158**, a collar **160**, and into a respective end brace **140**.

The blade/feed roll adjusting assembly **138** further comprises a pair of mounting blocks **162**. Each mounting block **162** is attached to a respective end brace **140** by a screw **166** passing through a washer **168** and into the respective end brace **140**.

The blade/feed roll adjusting assembly **138** further comprises a pair of ball plunger stubs **170**. Each ball plunger stub **170** extends into a through bore **172** in a respective mounting block **162**.

F. Impressions.

It will be understood that each of the elements described above or two or more together may also find a useful application in other types of constructions differing from the types described above.

While the embodiments of the present invention have been illustrated and described as embodied in a device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll, however, they are not limited to the details shown, since it will be understood that various omissions, modifications, substitutions, and changes in the forms and details of the embodiments of the present invention illustrated and their operation can be made by those skilled in the art without departing in any way from the spirit of the embodiments of the present invention.

Without further analysis the foregoing will so fully reveal the gist of the embodiments of the present invention that others can by applying current knowledge readily adapt them for various applications without omitting features that from the standpoint of prior art fairly constitute characteristics of the generic or specific aspects of the embodiments of the present invention.

6. Claims.

The invention claimed is:

1. A device for preventing jamming of a fibrous material subject to a compressive treatment in a stuffing chamber defined by a feed roll and a retard roll, comprising:

a) an impact blade; and

b) a stabilizing apparatus;

wherein said impact blade is rigid;

wherein said impact blade is interchangeable; and

wherein said stabilizing apparatus stabilizes said impact blade against moving away from the feed roll to prevent the jamming of the fibrous material between the feed roll and said impact blade during the compressive treatment of the fibrous material.

2. The device of claim 1, wherein said impact blade is thin;

wherein said impact blade is elongated;

wherein said impact blade is generally flat;

wherein said impact blade is interchangeable for fibrous material of different weights;

wherein said impact blade has an upper extreme;

wherein said impact blade has a lower extreme;

wherein said impact blade has a pair of sides; and

wherein said impact blade has a pair of free ends.

3. The device of claim 2, wherein said upper extreme of said impact blade has a pair of notches; and
wherein each notch of said impact blade extends from a respective free end of said impact blade to a short distance inward therefrom.

4. The device of claim 3, wherein said impact blade has a pair of through bores;
wherein each through bore of said impact blade extends laterally through said pair of sides of said impact blade;
wherein each through bore of said impact blade is disposed below a respective notch of said impact blade; and
wherein each through bore of said impact blade is disposed in proximity to a respective free end of said impact blade.

5. The device of claim 3, wherein said impact blade has a pair of end pins;
wherein each end pin of said impact blade extends outward from one side of said impact blade; and
wherein each end pin of said impact blade is disposed in proximity to a respective notch of said impact blade.

6. The device of claim 5, wherein said impact blade has a center pin;
wherein said center pin of said impact blade extends outward from said one side of said impact blade; and
wherein said center pins of said impact blade is disposed between said pair of end pins of said impact blade.

7. The device of claim 4, wherein said impact blade has a impact blade hook hand tool;
wherein said impact blade hook hand tool is L-shaped;
wherein said impact blade hook hand tool has a short portion;
wherein said impact blade hook hand tool has a long portion;
wherein said long portion of said impact blade hook hand tool is longer than said short portion of said impact blade hook hand tool;
wherein said long portion of said impact blade hook hand tool has a free end;
wherein said free end of said long portion of said impact blade hook hand tool has a pin thereon; and
wherein said pin of said long portion of said impact blade hook hand tool replaceably engages in a respective through bore of said impact blade so as to allow removal of said impact blade from said stabilizing apparatus by manually lifting said impact blade, via said impact blade hook hand tool, from said stabilizing apparatus, and so as to allow insertion of said impact blade into said stabilizing

apparatus by manually lowering said impact blade, via said impact blade hook hand tool, into said stabilizing apparatus.

8. The device of claim 6, wherein said stabilizing apparatus comprises a base support; wherein said base support of said stabilizing apparatus is elongated; wherein said base support of said stabilizing apparatus has a pair of free ends; wherein said base support of said stabilizing apparatus is generally inverted U-shaped; wherein said base support of said stabilizing apparatus has a transverse portion; and wherein said base support of said stabilizing apparatus has a pair of upright portions.

9. The device of claim 8, wherein said transverse portion of said base support of said stabilizing apparatus has a pair of primary through bores; and wherein each primary through bore of said transverse portion of said base support of said stabilizing apparatus is disposed in proximity to a respective free end of said base support of said stabilizing apparatus.

10. The device of claim 9, wherein said transverse portion of said base support of said stabilizing apparatus has four pair of secondary through bores; and

wherein each two pair of primary through bores of said transverse portion of said base support of said stabilizing apparatus straddle a respective primary through bore of said transverse portion of said base support of said stabilizing apparatus.

11. The device of claim 9, wherein said stabilizing apparatus comprises a mounting plate;
wherein said mounting plate of said stabilizing apparatus is flat;
wherein said mounting plate of said stabilizing apparatus is elongated;
wherein said mounting plate of said stabilizing apparatus is disposed above said transverse portion of said base support; and
wherein said mounting plate of said stabilizing apparatus lies between said pair of primary through bores of said transverse portion of said base support.

12. The device of claim 10, wherein said stabilizing apparatus comprises a blade holder body;
wherein said blade holder body of said stabilizing apparatus has a pair of free ends;
wherein said blade holder body of said stabilizing apparatus is elongated;
wherein said blade holder body of said stabilizing apparatus is generally L-shaped;
wherein said blade holder body of said stabilizing apparatus has a transverse portion; and
wherein said blade holder body of said stabilizing apparatus has an upright portion.

13. The device of claim 12, wherein said upright portion of said blade holder body of said stabilizing apparatus has a pair of end through slots; and
wherein each end through slot of said blade holder body of said stabilizing apparatus is axially disposed in proximity to a respective free end of said blade holder body of said stabilizing apparatus.

14. The device of claim 13, wherein said upright portion of said blade holder body of said stabilizing apparatus has a pair of primary through bores; and
wherein each primary through bore of said upright portion of said blade holder body of said stabilizing apparatus is disposed inward of a respective through slot of said blade holder body of said stabilizing apparatus.

15. The device of claim 13, wherein said upright portion of said blade holder body of said stabilizing apparatus has a center through slot;
wherein said center through slot of said upright portion of said blade holder body of said stabilizing apparatus is disposed between said pair of end through slots of said blade holder body of said stabilizing apparatus; and
wherein said center through slot of said upright portion of said blade holder body of said stabilizing apparatus is disposed in line with said pair of end through slots of said blade holder body of said stabilizing apparatus.

16. The device of claim 15, wherein said blade holder body of said stabilizing apparatus has a blade rest;

wherein said blade rest of said blade holder body of said stabilizing apparatus is thin;

wherein said blade rest of said blade holder body of said stabilizing apparatus is elongated;

wherein said blade rest of said blade holder body of said stabilizing apparatus extends along said upright portion of said blade holder body of said stabilizing apparatus, on a side thereof opposite to that of said transverse portion of said blade holder body of said stabilizing apparatus, past said pair of free ends of said blade holder body of said stabilizing apparatus, and below said pair of through slots of said blade holder body of said stabilizing apparatus so as to allow said lower extreme of said impact blade to rest thereupon, while one side of said impact blade rests against said upright portion of said blade holder body of said stabilizing apparatus, with said pair of end pins of said impact blade replaceably engaging in said pair of through slots of said blade holder body of said stabilizing apparatus, respectively, and with said center pin of said impact blade replaceably engaging in said center through slot of said upright portion of said blade holder body of said stabilizing apparatus.

17. The device of claim 14, wherein said stabilizing apparatus comprises a blade clamp stiffener;
wherein said blade clamp stiffener of said stabilizing apparatus is thin;
wherein said blade clamp stiffener of said stabilizing apparatus is elongated;
wherein said blade clamp stiffener of said stabilizing apparatus is laterally-oriented; and
wherein said blade clamp stiffener of said stabilizing apparatus is disposed on a side of said impact blade opposite to that of said blade holder body of said stabilizing apparatus so as to allow said impact blade to be captured between said blade clamp stiffener of said stabilizing apparatus and said blade holder body of said stabilizing apparatus.

18. The device of claim 17, wherein said blade clamp stiffener of said stabilizing apparatus has a side with a pair of bores;
wherein said pair of bores of said side of said blade clamp stiffener of said stabilizing apparatus are threaded; and
wherein said pair of bores of said side of said blade clamp stiffener of said stabilizing apparatus are in line with said pair of primary through bores of said upright portion of said blade holder body of said stabilizing apparatus, respectively.

19. The device of claim 14, wherein said stabilizing apparatus comprises a pair of hand knobs; and

wherein each hand knob of said stabilizing apparatus extends threadably into a respective primary through bore of said upright portion of said blade holder body of said stabilizing apparatus, and threadably into a respective bore of said blade clamp stiffener of said stabilizing apparatus, and when tightened, securely captures and stabilizes said impact blade between said blade holder body of said stabilizing apparatus and said blade clamp stiffener of said stabilizing apparatus.

20. The device of claim 12, further comprising an impact blade leveling assembly; and

wherein said impact blade leveling assembly levels said impact blade.

21. The device of claim 20, wherein said impact blade leveling assembly comprises three block shaft supports;

wherein said three block shaft supports of said impact blade leveling assembly are substantially identical to each other; and

wherein each block shaft support of said impact blade leveling assembly has a central through bore extending axially therethrough.

22. The device of claim 21, wherein each block shaft support of said impact blade leveling assembly has a pair of upper bores; and

wherein said three block shaft supports of said impact blade leveling assembly depend in said base support, with said pair of upper bores of each block shaft support of said impact blade leveling assembly aligned with a respective pair of secondary through bores of said transverse portion of said base support of said stabilizing assembly, and with a screw having a lock washer and a flat washer extending downwardly into a respective secondary through bore of said transverse portion of said base support of said stabilizing assembly and threadably into a respective upper bore of said three block shaft support of said impact blade leveling assembly to thereby secure said three block shaft supports of said impact blade leveling assembly to said base support.

23. The device of claim 21, wherein said impact blade leveling assembly comprises a jack shaft;

wherein said jack shaft of said impact blade leveling assembly has a slotted proximal end;

wherein said jack shaft of said impact blade leveling assembly has a distal end; and

wherein said jack shaft of said impact blade leveling assembly extends rotatably through said central through bore of each block shaft support of said impact blade leveling assembly via three flange bearings, respectively.

24. The device of claim 23, wherein said impact blade leveling assembly comprises a coupling; and

wherein one end of said coupling of said impact blade leveling assembly receives said slotted proximal end of said jack shaft of said impact blade leveling assembly, while the other end of said coupling of said impact blade leveling assembly receives one end of a shaft.

25. The device of claim 24, wherein said impact blade leveling assembly comprises a bearing block;

wherein said bearing block of said impact blade leveling assembly is stationarily affixed to a stationary structure via a pair of screws, two pair of flat washers, and two pair of nuts; and

wherein said bearing block of said impact blade leveling assembly has an axial through bore that rotatably receives the other end of said shaft of said impact blade leveling assembly.

26. The device of claim 24, wherein said impact blade leveling assembly comprises a hand wheel;

wherein said hand wheel of said impact blade leveling assembly has an indicator thereon; and

wherein said hand wheel of said impact blade leveling assembly fixedly receives said other end of said shaft of said impact blade leveling assembly so as to rotate therewith.

27. The device of claim 26, wherein said impact blade leveling assembly comprises a pair of collinearly aligned springs;
wherein said pair of collinearly aligned springs of said impact blade leveling assembly receive said jack shaft of said impact blade leveling assembly; and
wherein said pair of collinearly aligned springs of said impact blade leveling assembly are maintained against an intermediate block shaft support of said impact blade leveling assembly by a clamp-on collar.

28. The device of claim 27, wherein said impact blade leveling assembly comprises a pair of drive miter gears;
wherein each drive miter gear of said impact blade leveling assembly fixedly receives said jack shaft of said impact blade leveling assembly;
wherein each drive miter gear of said impact blade leveling assembly is disposed a distance outboard of an associated block shaft support of said impact blade leveling assembly determined by a clamp-on collar.

29. The device of claim 28, wherein said impact blade leveling assembly comprises a pair of jacking screws;
wherein each jacking screw of said impact blade leveling assembly has a wide lower end;
wherein each jacking screw of said impact blade leveling assembly has a thin threaded upper end;
wherein said thin threaded upper end of each jacking screw of said impact blade leveling assembly is thinner than said wide lower end of a respective jacking screw of said impact blade leveling assembly; and
wherein said thin threaded upper end of each jacking screw of said impact blade leveling assembly is separated from said wide lower end of a respective jacking screw of said impact blade leveling assembly by a flange.

30. The device of claim 29, wherein said wide lower end of each jacking screw of said impact blade leveling assembly sits in a respective primary through bore of said transverse portion of said base support of said stabilizing assembly, with said flange of a respective jacking screw of said impact blade leveling assembly preventing said respective jacking screw of said impact blade leveling assembly from falling therethrough.

31. The device of claim 29, wherein said impact blade leveling assembly comprises a pair of driven miter gears; and

wherein each driven miter gear of said impact blade leveling assembly fixedly receives said wide lower end of a respective jacking screw of said impact blade leveling assembly, with a bronze bushing sitting in a respective primary through bore of said transverse portion of said base support of said stabilizing assembly, and with each driven miter gear of said impact blade leveling assembly being held on said wide lower end of said respective jacking screw of said impact blade leveling assembly by a snap ring.

32. The device of claim 31, wherein one drive miter gears of said impact blade leveling assembly engages with an associated driven miter gear of said impact blade leveling assembly, so when said hand wheel is rotated, said jack shaft of said impact blade leveling assembly rotates, which rotates said pair of drive miter gears of said impact blade leveling assembly, which rotates said associated driven miter gear of said impact blade leveling assembly engaged therewith, which rotates an associated jacking screw of said impact blade leveling assembly.

33. The device of claim 31, wherein normally said drive miter gear of said impact blade leveling assembly closest to said hand wheel of said impact blade leveling assembly is engaged with an associated driven miter gear of said impact blade leveling

assembly by virtue of biasing of said pair of collinearly aligned springs of said impact blade leveling assembly, however, when said jack shaft of said impact blade leveling assembly is pushed in via said hand wheel of said impact blade leveling assembly against said biasing of said pair of collinearly aligned springs of said impact blade leveling assembly, then said drive miter gear of said impact blade leveling assembly closest to said hand wheel of said impact blade leveling assembly is disengaged and the other drive miter gear of said impact blade leveling assembly is engaged with an associated driven miter gear of said impact blade leveling assembly.

34. The device of claim 31, wherein said impact blade leveling assembly comprises a pair of bar nuts;

wherein each bar nut of said impact blade leveling assembly fits into a respective secondary through slot of said blade holder body of said stabilizing apparatus so as to allow said blade holder body of said stabilizing apparatus to move up and down therewith; and

wherein each bar nut of said impact blade leveling assembly has a threaded central through bore therein that receives said thin threaded upper end of an associated jacking screw of said impact blade leveling assembly so when a respective driven miter gear of said impact blade leveling assembly is engaged and rotated, said thin threaded upper end of said associated jacking screw of said impact blade leveling

assembly rotates and threads an associated bar nut of said impact blade leveling assembly up or down thereon, which in turn causes an associated free end of said blade holder body of said stabilizing apparatus to move up or down accordingly with said impact blade affixed thereto, and thereby level said impact blade.

35. The device of claim 10, further comprising a blade/feed roll adjusting assembly; and

wherein said blade/feed roll adjusting assembly adjustably spaces said impact blade from the feed roll.

36. The device of claim 35, wherein said blade/feed roll adjusting assembly comprises a pair of end braces; and

wherein each end brace of said blade/feed roll adjusting assembly extends upwardly from a respective free end of said base support of said stabilizing assembly, and is maintained fixedly thereat by a pair of screws having washers thereon and passing through a respective pair of secondary through bore of said transverse portion of said base support of said stabilizing assembly, and threadably into a respective end brace of said blade/feed roll adjusting assembly.

37. The device of claim 36, wherein said blade/feed roll adjusting assembly comprises a pair of spacers; and

wherein each spacer of said blade/feed roll adjusting assembly extends fixedly across a respective end brace of said blade/feed roll adjusting assembly.

38. The device of claim 36, wherein said blade/feed roll adjusting assembly comprises a pair of pivot plates; and
wherein each pivot plate of said blade/feed roll adjusting assembly is disposed on a respective end brace of said blade/feed roll adjusting assembly, and is maintained thereat by a screw.

39. The device of claim 38, wherein said blade/feed roll adjusting assembly comprises a pair of spreader bearings; and
wherein each spreader bearing of said blade/feed roll adjusting assembly is attached to a respective pivot plate of said blade/feed roll adjusting assembly by a stud/screw combination.

40. The device of claim 38, wherein said blade/feed roll adjusting assembly comprises a pair of hand knobs; and
wherein each hand knob of said blade/feed roll adjusting assembly extends into a respective anchor mount of said blade/feed roll adjusting assembly, a collar of said blade/feed roll adjusting assembly, and into a respective end brace of said blade/feed roll adjusting assembly.

41. The device of claim 38, wherein said blade/feed roll adjusting assembly comprises a pair of mounting blocks; and

wherein each mounting block of said blade/feed roll adjusting assembly is attached to a respective end brace of said blade/feed roll adjusting assembly by a screw passing through a washer and into said respective end brace of said blade/feed roll adjusting assembly.

42. The device of claim 41, wherein said blade/feed roll adjusting assembly comprises a pair of ball plunger stubs; and

wherein each pair of ball plunger stubs of said blade/feed roll adjusting assembly extends into a through bore in a respective mounting block of said blade/feed roll adjusting assembly.

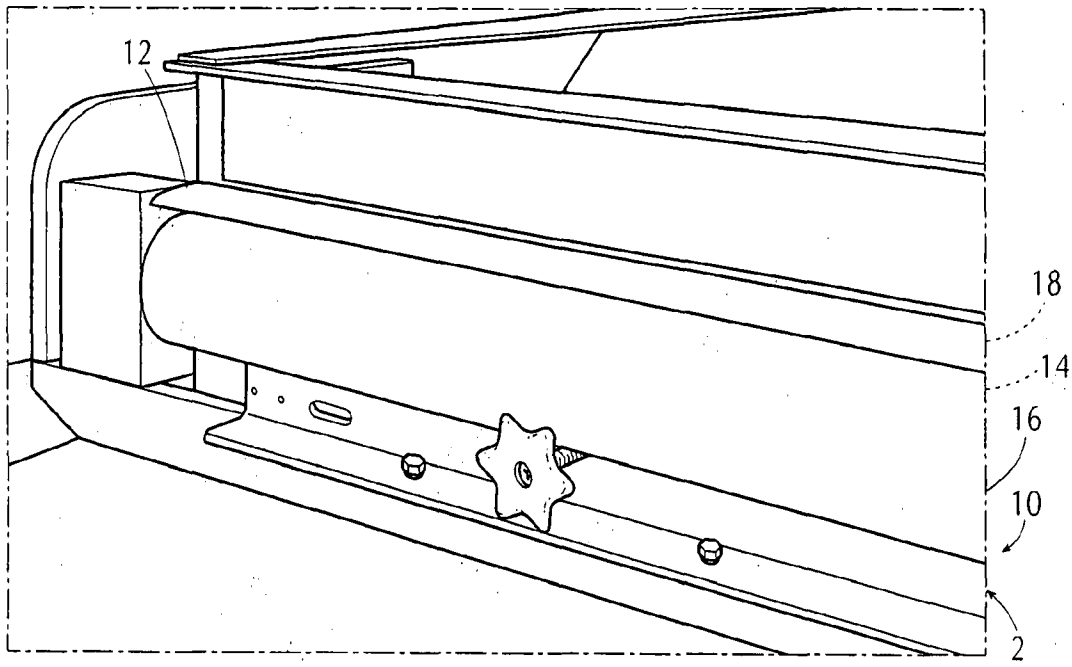


FIG. 1

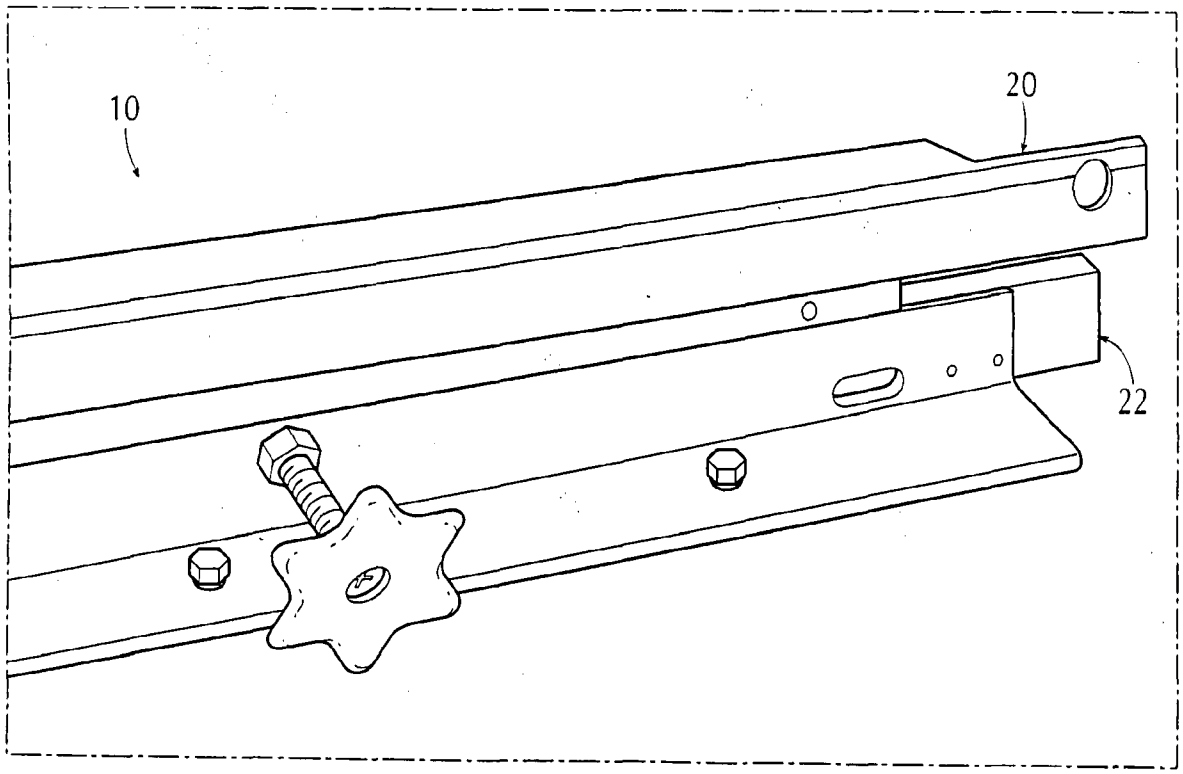


FIG. 2

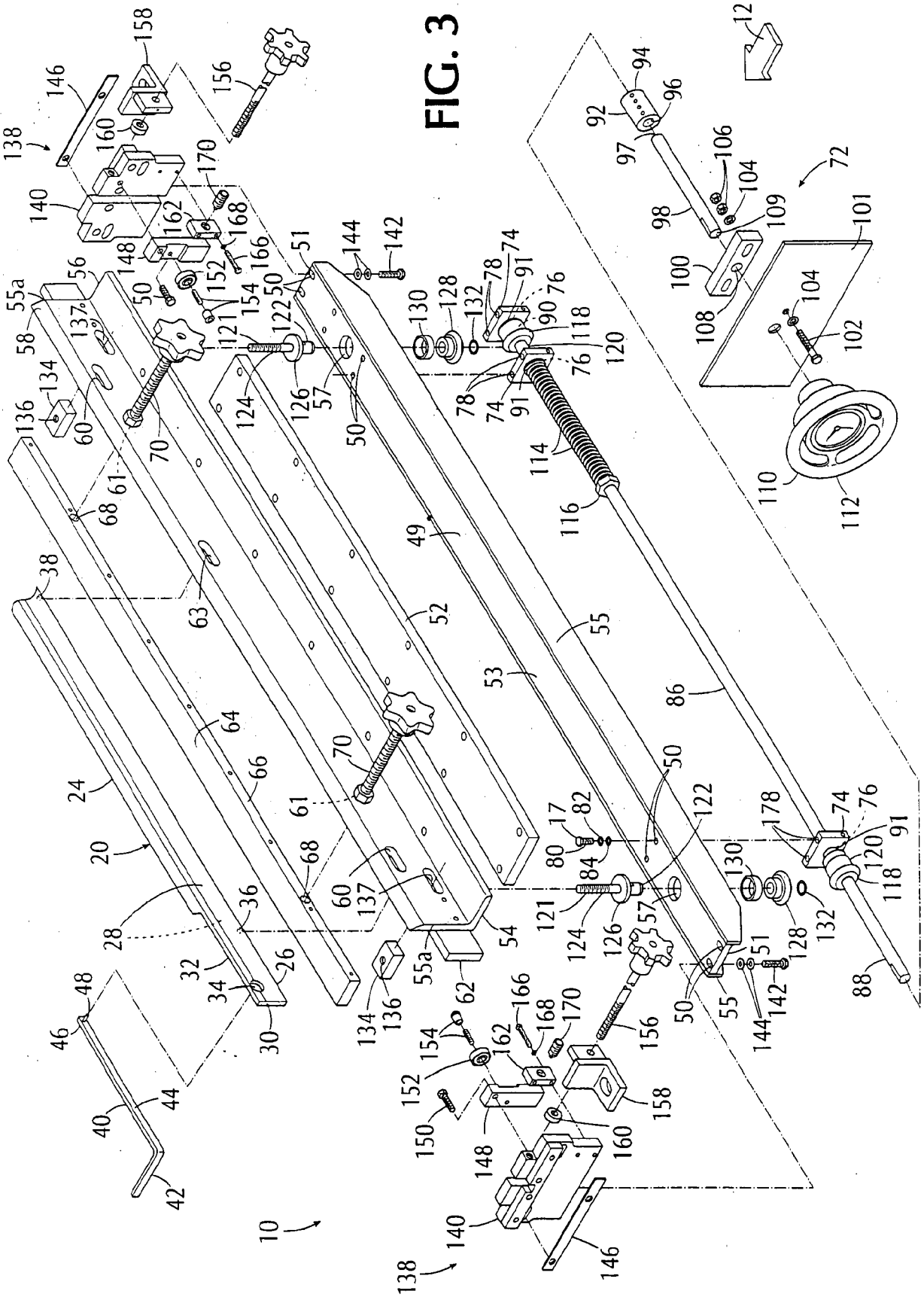


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/000004

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - D06C 21/00 (2011.01)
USPC - 26/18.6
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - D06C 21/00 (2011.01)
USPC - 26/18.5, 18.6, 19; 28/116, 140, 165; 162/111, 280, 361

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

MicroPatent, Google Patents
Search terms used: impact, blade, fibrous, material, compressive, fabric, treatment, preventing, jamming, textile, cloth, construction, stuffing, chamber, hand, knob, hook, tool

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 5,666,703 A (WALTON et al) 16 September 1997 (16.09.1997) entire document	1, 2 --- 3-21, 23-42
Y	US 5,060,349 A (WALTON et al) 29 October 1991 (29.10.1991) entire document	3-21, 23-42
Y	US 6,507,986 B1 (TOMISER, JR. et al) 21 January 2003 (21.01.2003) entire document	7
Y	US 4,644,900 A (POTERALA) 24 February 1987 (24.02.1987) entire document	19-21, 23-42
Y	US 2,765,514 A (WALTON) 09 October 1956 (09.10.1956) entire document	23-34
Y	US 5,012,562 A (CATALLO) 07 May 1991 (07.05.1991) entire document	28-34

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 February 2011	10 MAR 2011
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774