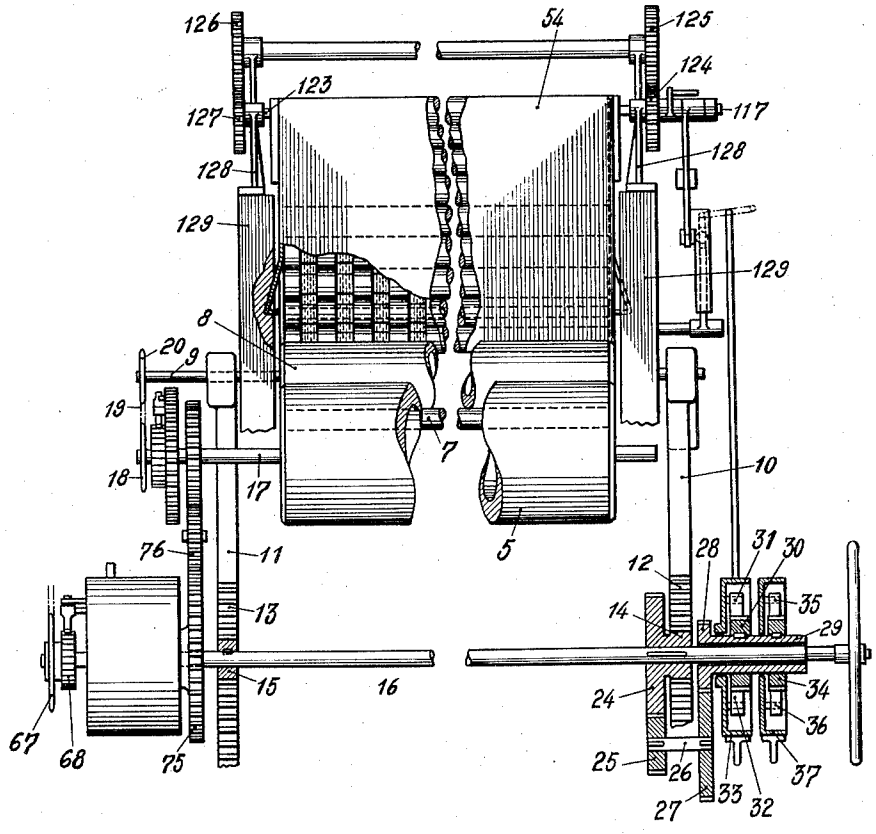
Oct. 14, 1958 RYUHEI KAWAZURA ET AL 2,856,136

MACHINE FOR FORMING FIBRE LAPS

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Fig. 1



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MACHINE FOR FORMING FIBRE LAPS

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Fig. 3

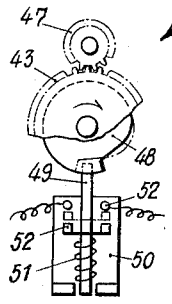
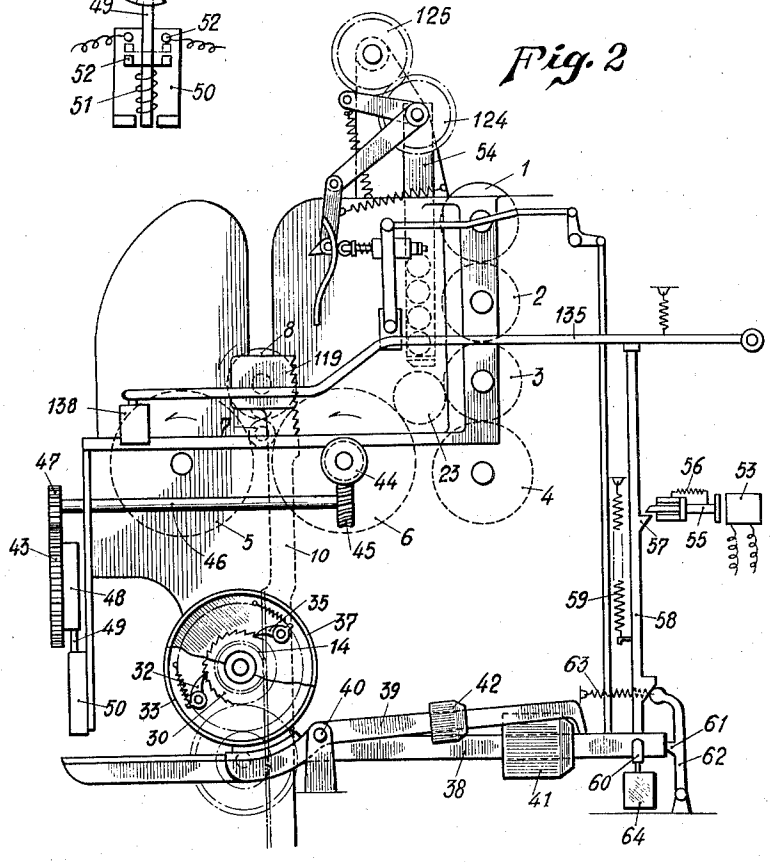


Fig. 2



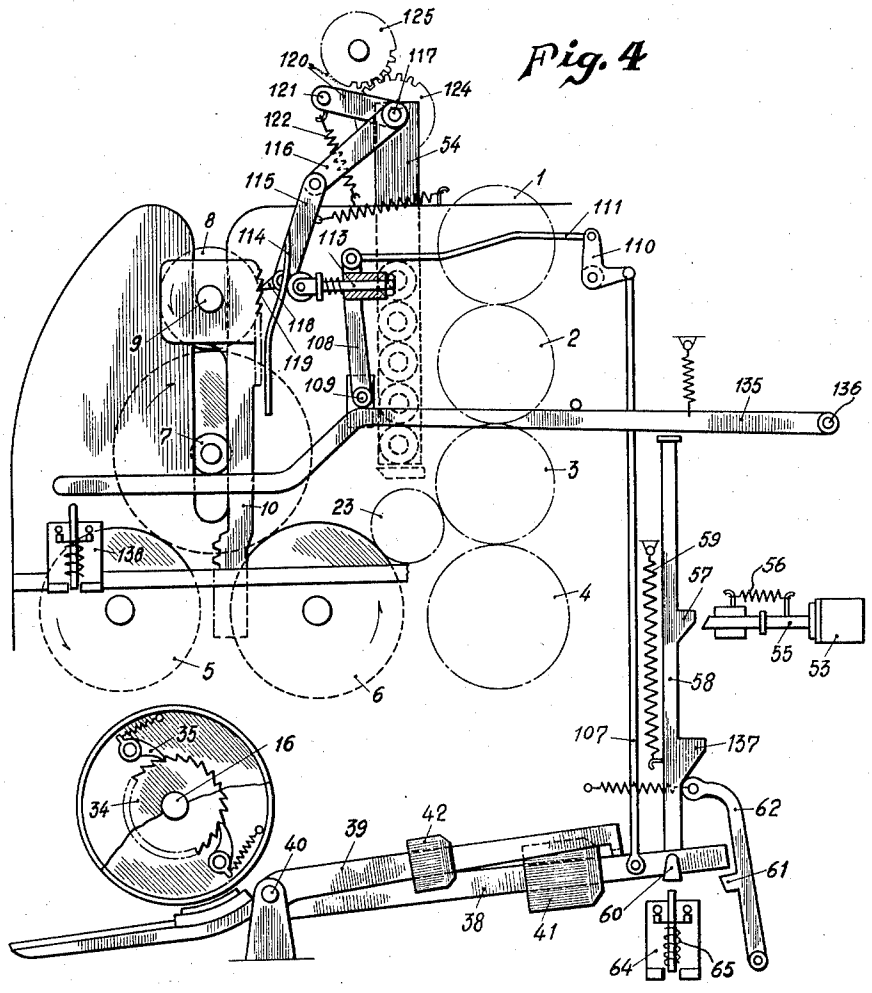
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MACHINE FOR FORMING FIBRE LAPS

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Fig. 4



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Fig. 5

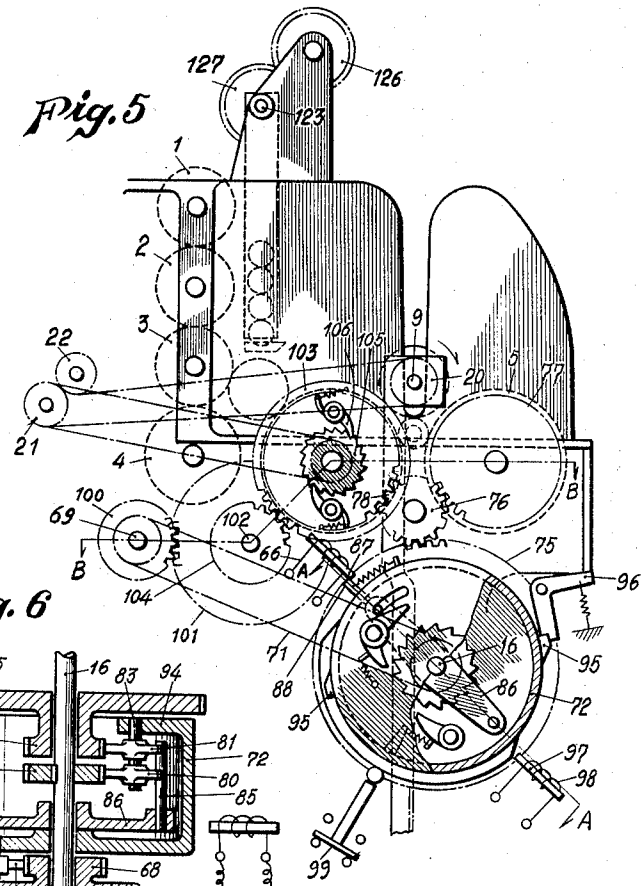


Fig. 6

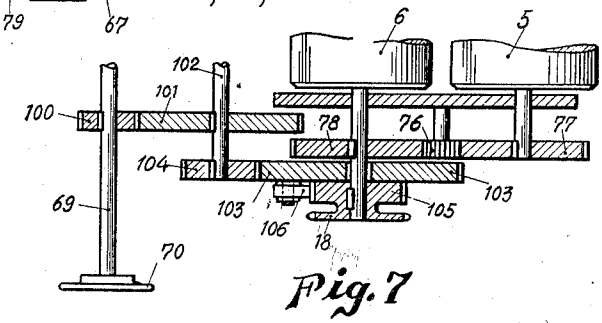


Fig. 7

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Fig. 8a

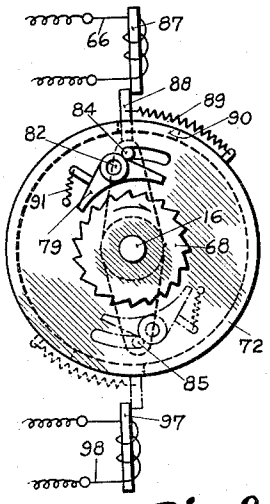


Fig. 8b

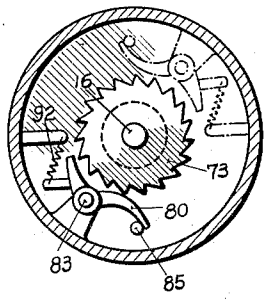


Fig. 8c

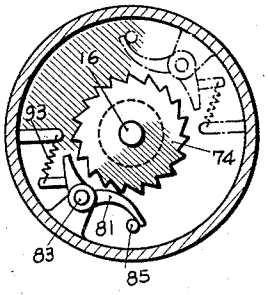


Fig. 9a

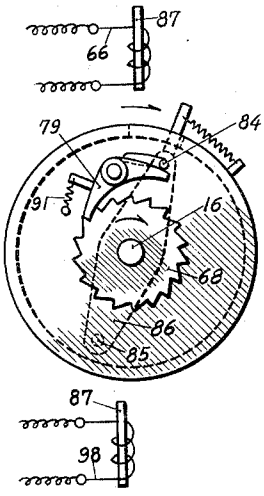


Fig. 9b

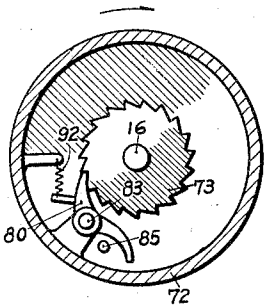
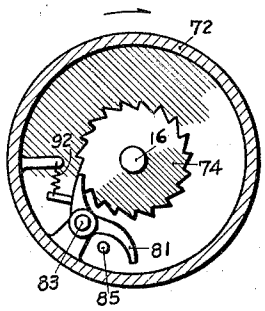


Fig. 9c



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Fig. 10

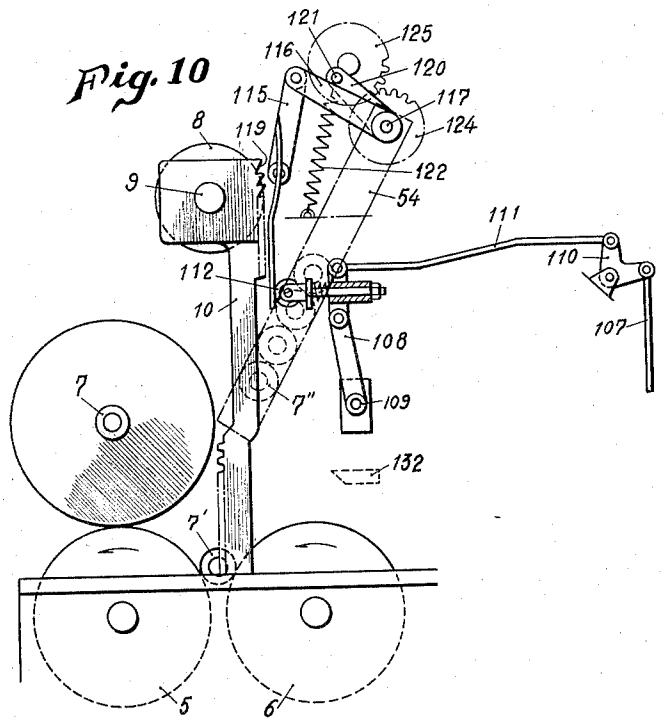


Fig. 11

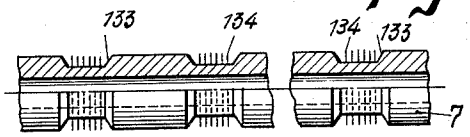
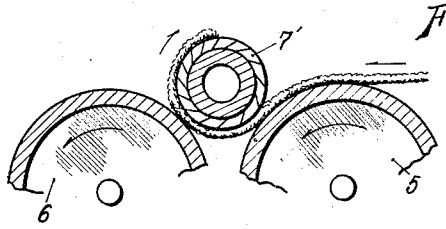


Fig. 12



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MACHINE FOR FORMING FIBRE LAPS

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Fig. 13

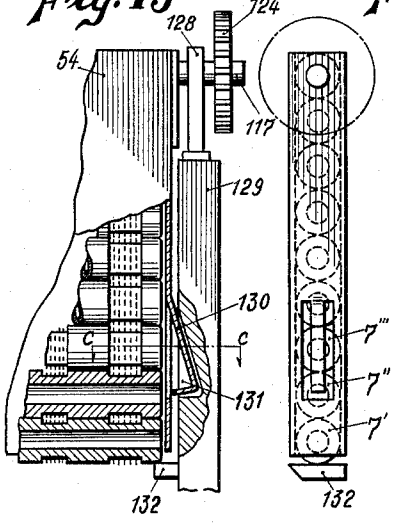


Fig. 14

Fig. 15

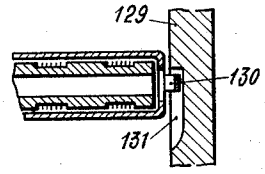


Fig. 17

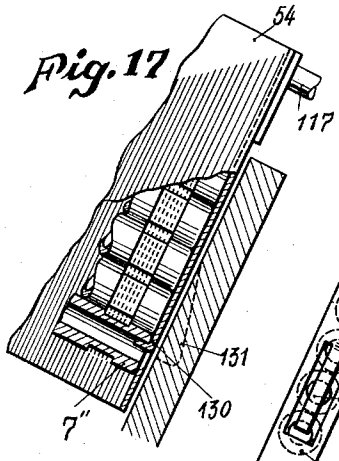
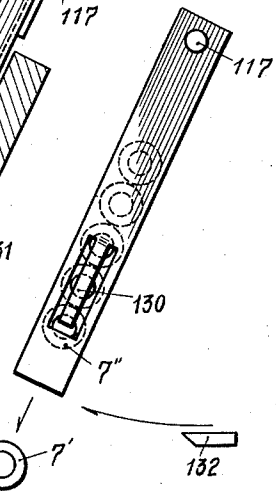


Fig. 16



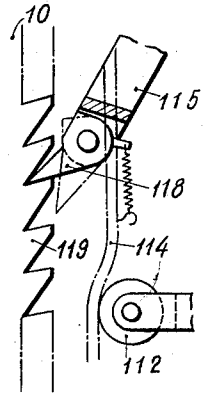


Fig. 18

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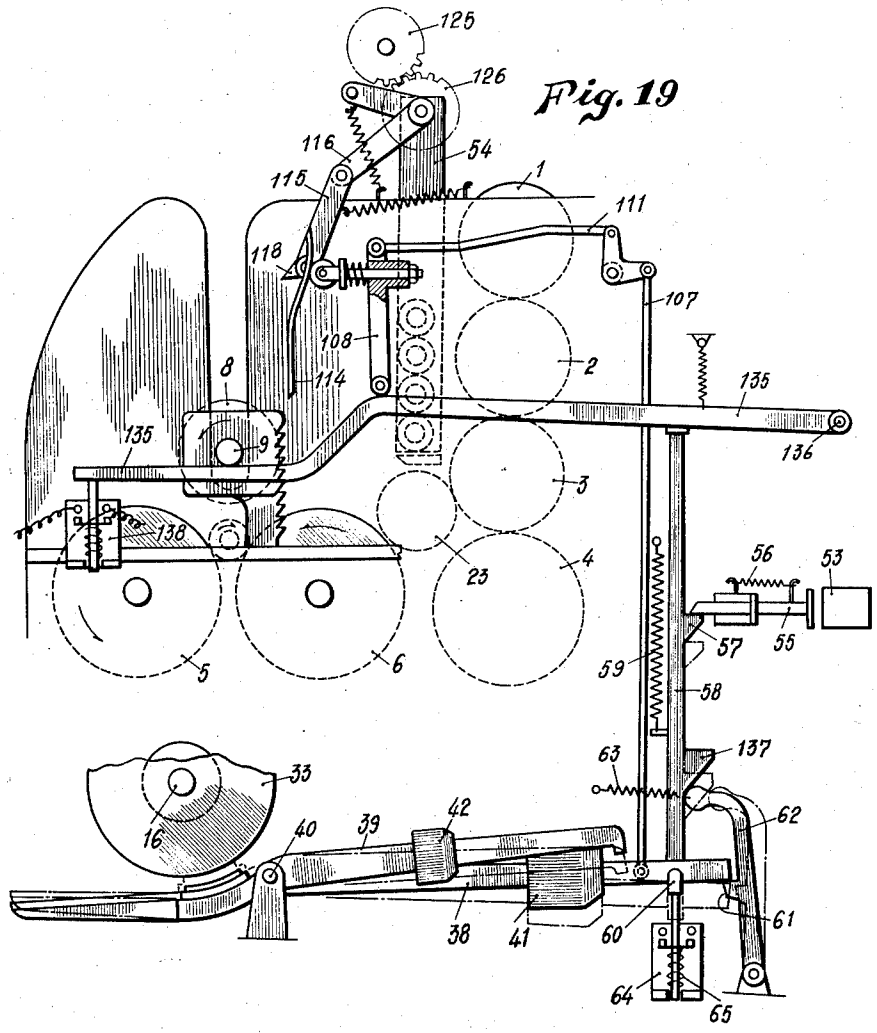
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MACHINE FOR FORMING FIBRE LAPS

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Fig. 19



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United States Patent Office 2,856,136 Patented Oct. 14, 1958

2,856,136

MACHINE FOR FORMING FIBRE LAPS

Ryuhei Kawazura, Higashinada-ku, Kobe, Kazuo Fujii, Fuse, and Masaru Fujiwara, Hyogo-ku, Kobe, Japan, assignors to Kanegafuchi Spinning Co., Ltd., Tokyo, Japan, a joint-stock company of Japan

Application February 15, 1954, Serial No. 410,226

Claims priority, application Japan August 14, 1953

6 Claims. (Cl. 242—55.1)

This invention relates to a method and machine for forming fibre laps automatically and continuously. The machine is for use in conjunction with certain textile machines and in certain other analogous circumstances, for the formation of a lap-roll of fibrous material.

It is a general object of the present invention to provide an improved method and machine for forming fibre laps automatically and continuously without any manual labor and without stopping the machine.

The present invention employs a novel means for forming a tightly rolled lap. According to the invention the lap being wound is pressed downwardly against a pair of fluted lap-forming rollers by a press-roller positioned on and in contact with said lip. The press-roller is rotatably supported by a pair of vertical bars the upward movement of which is caused by the growth of the lap in diameter is restrained. As soon as a predetermined length of the fibre material is wound upon the lap-roller the restraint is released and at the same time the bars with the press-roller thereon are lifted so that the lap is able to be taken out.

Simultaneously with the upward movement of the press-roller the lap-forming rollers are rotated rapidly so that the lap-end is broken free from the unlapped fibre material and the loose end of the lap is rapidly and completely wrapped around the lap. Apart from this and almost at the same time an empty lap-roller magazine is swung forwardly, thereby feeding a new empty lap-roller to the lap-forming position and at the same time kicking out the complete lap with the lower end portion of said magazine. Then, all the members of the machine are restored to the normal operating condition and the next cycle of the operation commences. The rapid and the normal operations are cycled continuously and without stopping the machine so that fibre laps are automatically and continuously formed.

Other objects and features of the invention will become apparent from the following description and the accompanying drawings which respectively explains and shows one embodiment of the present invention.

In the drawings:

Fig. 1 is a somewhat diagrammatic front view of a machine embodying the present invention, the view being partly broken away.

Fig. 2 is a fragmentary and diagrammatic side view of Fig. 1.

Fig. 3 is a detail illustrating means for actuating a switch to energize a magnet associated with a braking action releasing means.

Fig. 4 is a fragmentary side view similar to Fig. 2 but showing the condition in which the braking action is started by the energization of the magnet.

Fig. 5 is a fragmentary side view as viewed from the side opposite to that shown in Fig. 2 and showing the drive mechanism of the main parts of the machine.

Fig. 6 is a sectional view taken along the line A—A of Fig. 5.

Fig. 7 is a sectional view taken along the line B—B of Fig. 5.

Figs. 8*a*, 8*b* and 8*c* are details illustrating the condition in which ratchet-wheels in and adjacent a "rotative case" are not in mesh with the corresponding pawls.

Figs. 9*a*, 9*b* and 9*c* are views similar to Figs. 8*a*, 8*b* and 8*c* respectively but showing the condition in which the ratchet-wheels are in mesh with the respective pawls.

Fig. 10 is a fragmentary and diagrammatic view illustrating the lap-roller magazine swinging mechanism.

Fig. 11 is a fragmentary side view, half in section, of a lap-roller.

Fig. 12 is a schematic view illustrating the condition in which the lap-forming operation is initiated.

Fig. 13 is a fragmentary view showing the lap-roller magazine and its associated members.

Fig. 14 is a side view of the magazine.

Fig. 15 is a sectional view taken along the line C—C of Fig. 13.

Fig. 16 is a view similar to Fig. 14 but showing the condition in which the magazine is swung.

Fig. 17 is a view similar to Fig. 13 but showing the condition in which the magazine is swung to the discharge position.

Fig. 18 is a fragmentary view of an enlarged part of Fig. 10.

Fig. 19 is a view similar to Figs. 2 and 4 but showing the relative position of some parts of the machine just before commencing the normal operation.

Referring to the drawing, particularly to Figs. 1 and 2, the machine comprises a series of calender rollers **1**, **2** **3** and **4**, a pair of fluted lap-forming rollers **5** and **6**, and a lap-roller **7** as is usual in this type of machine. Indicated by the numeral **8** is a press-roller which acts to press the lap-roller **7** downwardly so that the lap is pressed downwardly upon the surface of the rollers **5** and **6**. The shaft **9** of the press-roller **8** is rotatably supported by a pair of supporting bars **10** and **11** which have rack portions **12** and **13** meshing with gears **14** and **15** respectively secured to a "brake-shaft" **16**. Said press-roller **8** is driven in the direction indicated by an arrow (Fig. 2) from the shaft **17** of the rotating lap-forming roller **6** through a sprocket wheel **18** on the shaft **17**, chain **19** and a sprocket wheel **20** secured to the shaft **9** of the press-roller. Between the wheels **18** and **20** it is preferred to provide an intermediate wheel **21** and a tensioning wheel **22** as shown in Fig. **5**.

Continuous fibre material is fed in a known manner through the calender rollers **1**, **2**, **3**, **4** and an intermediate roller **23** onto the lap-forming roller **6** and the leading edge is wound on the lap-roller **7** placed on and between the lap-forming rollers **5** and **6**, whereby the formation of a lap is initiated. As the fibrous material is wound on the lap-roller **7** and the lap diameter increases gradually the lap will rise against the press-roller **8** and consequently the supporting bars **10** and **11** are pushed upwardly together with the press roller. To restrain the upward movement of the bars with the press-roller thereon as the lap diameter increases, in order to ensure the formation of a tightly rolled lap, the machine employs a braking means. On the "brake-shaft" **16** a gear **24** is secured to the gear **14** meshing with the rack **12** on the supporting bar **7**. The gear **24** meshes with a gear **25**, to the shaft **26** of which is secured a gear **27**, gear **27** being at the opposite end of shaft **26**. The gear **27** meshes with a gear **28** which is loosely mounted on the shaft **16**. On a boss **29** of the gear **28** there is secured a ratchet wheel **30** which engages pawls **31** and **32** mounted on and within a brake wheel **33**. It will be understood that the upward movement of the bar caused by the increase of the lap diameter is transmitted to the brake wheel **33** causing its

rotation. Another ratchet wheel 34 also secured on the boss 29 of the gear 28 is so arranged that its teeth are directed in a direction opposite to the direction of the teeth of the ratchet wheel 30 and it is accordingly inactive when the supporting bars move upwardly. However, when the bars move downwardly the ratchet wheel 34 engages pawls 35 and 36 secured to a brake wheel 37, which consequently is rotated. Brake levers 38 and 39 forked at a point 40 which is the common fulcrum have slidably suspended thereon weights 41 and 42 respectively. It will be understood from this construction that by applying the brake shoe on each of the levers to the brake wheel 33 or 37 the upward or downward movement of the supporting bars is suitably controlled. The fibrous material is thus tightly wound around the lap-roller 7.

The operation of forming the lap on said lap-roller 7 proceeds until the diameter of the lap reaches a certain predetermined value. This value is controlled by a signal-wheel 43 which is driven from the lap-forming roller 6 through a worm 44 secured to the shaft 17 of said roller 6, a worm-wheel 45, the shaft 46 and a gear 47, which latter is in mesh with gear-teeth upon said wheel 43. The transmission is so adjusted that a predetermined length of the material is wound during each rotation of the signal-wheel 43. Coaxial with the shaft of the signal-wheel 43 there is provided a cam 48 which rotates together with said wheel 43 and is so formed and arranged that every time a predetermined length of the material is wound a button 49 of a switch 50 which is always in contact with said cam 48 by means of a spring 51 falls into a notch formed on said cam as shown by a dotted line in Fig. 3 and contacts 52 are closed, thereby completing the energizing circuit for a magnet 53 (Fig. 4).

To form fibre laps continuously and automatically in accordance with the present invention the following operations are performed almost simultaneously—namely, (1) release of the braking pressure applied to the brake-wheel 21, (2) rapid upward movement of the press-roller 8, (3) rapid rotation of the fluted lap-forming rollers 5 and 6 to break the lap-end and to wrap the loose end of the same rapidly and completely, and (4) swinging movement of a magazine 54 for lap-rollers to eject or kick out the completed lap and deliver a fresh lap-roller on the lap-forming rollers in place of said completed lap. These operations are initiated by the energization of the magnet 53 hereinbefore described.

Upon energization of the magnet 53 a rod or plunger 55, which normally is kept away from the magnet by means of a spring 56 and is in engagement with a projection 57 provided on a vertical rod 58, is drawn toward said magnet with the result that the rod 55 is disengaged from the projection 57 and at the same time the vertical rod 58 is pulled up by a spring 59 as shown in Fig. 4. The vertical rod 58 has at its lower end a hook 60 engaging with the end portion of the brake-lever 38. It will be understood that by pulling up the vertical rod 58 the end portion of the brake-lever 38 is also pulled up and the braking force applied to the brake-wheel is released. At this time a projection 61 which is provided on a lever 62 adjacent the end of the brake-lever 38 and is held in contact with the extremity of said brake-lever by means of a spring 63 as shown in Fig. 2 is released from such contact and moves under the end of said brake-lever 38 as shown in Fig. 4.

Thus, when a predetermined length of the fibre material is wound up the braking force applied to the brake-wheel is released and movement of the pair of bars 10 and 11 supporting the press-roller 8 is no longer braked, and simultaneously the supporting bars 10 and 11 together with the press-roller 8 are rapidly moved upwardly by the means hereinafter described.

Simultaneously with the ascent of the rod 58 and removal of the braking action a switch 64 which normally is pressed down by the hooked portion 60 of the rod 58 is closed by means of a spring 65, thereby completing the energizing circuit for a magnet 66 (Fig. 5).

Apart from the above, referring to Figs. 1, 5, 6 and 7, a sprocket-wheel 67 which is integrally connected to a ratchet-wheel 68 and is driven from a shaft 69 through a sprocket-wheel 70 and a chain 71 is loosely fitted on the brake-shaft 16. A rotatable case 72 is also loosely fitted on the brake-shaft and in the case 72 a ratchet-wheel 73 is secured to said shaft 16, on which is also loosely fitted a ratchet-wheel 74 which is integrally connected to a gear 75 extending outside of the rotatable case 72 and meshing with an intermediate gear 76 which meshes with drive gears 77 and 78 for the respective lap-forming rollers 5 and 6. Indicated by the numerals 79, 80 and 81 are pawls for the ratchet-wheels 68, 73 and 74 respectively. During the normal rotation of the lap-forming rollers 5 and 6, that is to say until the predetermined length of the material is wound up, these pawls 79, 80 and 81, which former is loosely mounted on a bar 82 and latter two of which are loosely mounted on a bar 83, are so restrained by pegs 84 and 85 provided on an "actuating plate" 86 loosely fitted on the brake-shaft 16 that they do not engage with the respective ratchet-wheels 68, 73 and 74 as shown by the full lines in Fig. 8. Therefore, during the normal operation of the machine, that is to say until a lap of the predetermined length is wound up, the ratchet-wheel 74 and the gear 75 driven from the drive gear 78 on the shaft 17 of the lap-forming roller 6 through the intermediate gear 76 rotate freely on the brake-shaft 16.

Referring now to Figs. 5, 6, 7, 8 and 9, when the magnet 66 is energized as hereinbefore described a rod or plunger 87 is moved by said magnet 66 and a projection 88 on the actuating plate 86 and extending therefrom outwards of the rotatable case 72 and normally held by the end portion of the rod 87 is released so that by means of a spring 89 secured to the rotatable case 72 the plate 86 is rotated on the shaft 16 along and through the length of a slot or groove 90 provided on the circumferential wall of the rotatable case. In consequence, the pawls 79, 80 and 81 are disengaged from the pegs 84 and 85 and mesh with the corresponding ratchet-wheels 68, 73 and 74 by means of respective springs 91, 92 and 93 as shown in Fig. 9. Since the pawl 79 is mounted on the bar 82 secured to the rotatable case 72 the engagement of said pawl 79 with the rotating ratchet-wheel 68 will cause rotation of the rotatable case and also of the ratchet-wheels 73 and 74 which are now in engagement with the respective pawls 80 and 81 mounted on the bar 83 secured to an inner projection 94 on the rotatable case 72. As the ratchet-wheel 73 now being driven is secured to the shaft 16, said shaft is also driven at the same speed as the rotatable case 72. Therefore, the gears 14 and 15 which are secured to the shaft 16 and are meshed with the racks 12 and 13 on the respective bars 10 and 11 are rotated together with the shaft 16 and accordingly the bars 10 and 11 together with the press-roller 8 are automatically and rapidly lifted so that the lap is released from the pressure of the press-roller 8.

The machine is so adjusted that the rapid rising of the supporting bars 10 and 11 takes place every half rotation of the rotatable case 72 and to ensure this operation there is provided on the rotatable case projections 95 which engage a brake-lever 96 every half rotation of the rotatable case. When the case 72 rotates through half a revolution the projection 88 on the actuating plate 86 is obstructed by a rod or plunger 97 positioned at the opposite side of the rod 87, whereby the plate 86 is stopped. A magnet 98 is also provided on the opposite side from the magnet 66 and the circuit is so arranged through an alternating switch 99 that the magnets 66 and 98 are energized alternately by the closing of the switch 64. Regardless of the stopping of said plate 86, the rotatable case 72 continues to travel against the action of spring 89 through the length of the slot 90 as shown by the dotted line in Fig. 8 and accordingly the pawls 79, 80 and

81 are disengaged from the respective ratchet-wheels 68, 73 and 74. In this way the rotation of the shaft 16 is stopped and the rapid rising of the supporting bars 10 and 11 together with the press-roller 8 is also discontinued. Thus the lap is placed in a position to be able to be taken out easily.

As the predetermined length of the fibre material is wound upon the lap-roller 7 it is necessary, before ejecting the lap, to break the lap free from the unlapped fibre material and to wind up the loose end of the lap completely. As previously described the ratchet wheel 74 is rotated by engagement of the pawl 81 with the teeth of said ratchet wheel with the result that the gear 75 integrally connected to said ratchet wheel is also rotated. The lap-forming rollers 5 and 6 are rapidly driven from the gear 75 through the intermediate gear 76 and the drive gears 77 and 78. At this stage the lap-forming rollers 5 and 6 are rotated at a speed considerably faster than the speed during the normal lap building operation and consequently the unlapped fibre material continuously fed from the calender rollers 1, 2, 3 and 4 at the normal speed is broken from the lap at a point between the bottom calender roller 4 and the lap-forming roller 6 and the loose lap end is rapidly and completely wound. When the press-roller is raised as described before the lap-end has already been broken, and upon stopping of the rotation of the rotatable case the rapid rotation of the lap-forming rollers is also discontinued and the normal operation as described hereafter commences to form the next lap.

The normal rotation of the lap-forming rollers 5 and 6, namely the rotation of said lap-forming rollers until the predetermined length of the material is wound up and the rollers are rapidly rotated, is derived from the main shaft 69 which is constantly driven from a suitable source of power (not shown). As shown in Figs. 5 and 7 the lap-forming roller 6 is driven from the shaft 69 through a gear 100 secured to said shaft 69, a gear 101 secured to a "drop-shaft" 102 and meshing with said gear 100, a gear 103 loosely mounted on the shaft 17 of the lap-forming roller 6 and meshing with a gear 104 secured to said drop-shaft 102, and a ratchet-wheel 105 secured to said shaft 17 and engaging with a pawl 106 secured on said gear 103. The lap-forming roller 5 is driven from the shaft 17 of the lap-forming roller 6 through the drive gear 78 on said shaft 17, the intermediate gear 76 meshing with said gear 78, and the drive gear 77 secured to the shaft of the roller 5 and meshing with said gear 76. In this case, namely during the normal operation of the machine, it should be recalled that the ratchet-wheel 74 is not as yet in mesh with the pawl 81 and accordingly the wheel 74 and the gear 75 now being driven by the gear 76 will not influence the brake-shaft 16 as they are loosely mounted thereon. It should be also understood that during the rapid rotation of the lap-forming rollers the pawl 106 will not take part in the operation because said pawl will merely slide on and not engage with the teeth of the ratchet-wheel 105.

As soon as the lap is completed it is necessary to eject the complete lap and feed a fresh lap-roller in place thereof. This operation is effected by swinging of the lap-rollers magazine 54. Referring to Figs. 4 and 10 and 18 when the end portion of the brake-lever 38 is pulled up a vertical link 107 parallel to the vertical rod 58 and connected at its lower end to said lever is also lifted with the result that an arm 108 pivotally connected to the frame of the machine at 109 as the fulcrum is pushed forwardly in the direction of an arrow (Fig. 4) through a L-shaped link 110 and a link 111. Consequently, a roller 112 pivotally mounted on the extremity of a pin 113 held by the arm 108 pushes a guide 114 provided on a lever 115 the upper end of which is connected to the lower end of an arm 116 loosely mounted at its upper end on a "projection rod" 117 projecting outwardly from the upper portion of the side wall of the magazine 54 as shown in Fig. 1. A pawl 118 secured to the lower end of the lever 115, therefore, engages with teeth 119 provided on the upper portion of the supporting bar 10 which is now rapidly moving upwards, so that the pawl 118 (see Fig. 18) is lifted with the result that the arm 116 is swung upwardly as shown in Fig. 10 and an arm 120 secured to the projection rod 117 is also swung upwardly against the action of a spring 122 by engagement of the arm 116 with a projection 121 provided on the free end of said arm 120. By the upward swing of the arm 120 to which the projection rod 117 is secured the magazine 54 is also swung as well shown in Fig. 10. To ensure the smooth swinging movement of the magazine 54 the upper portion of the opposite side wall of the magazine is provided with a similar projection rod 123 which is revolved from a gear 124 secured to the projection rod 117 of the opposite side through gears 125, 126 and 127 which latter is secured to the projection rod 123 (see Fig. 5).

Referring to Figs. 13, 14, 15, 16 and 17, a row of lap-rollers $7'$, $7''$ . . . 7^n are stored in the magazine 54. Each of the projection rods 117 and 123 is rotatably supported by an arm 128 projecting from a fixed member 129 positioned adjacent each side wall of the magazine and forming a part of the frame of the machine. As shown in Figs. 1 and 13 each side wall of the magazine 54 has a recess 131 therein and a hooked-shaped elastic member 130 secured by its root portion to the side wall is fitted into the recess. When the magazine 54 is not in the swung position said elastic member 130 falls into the recess 131 and does not act on any of the lap-rollers which are held by a stopper 132 projecting from the frame of the machine and preventing the lap-rollers from falling. The recess 131 is so formed that in gradually decreases in depth towards the direction in which the magazine 54 is swung, so that when the magazine is swung forwardly the bottom lap-roller $7'$ will fall because of becoming disengaged from the stopper 132 and almost simultaneously the hook portion of the elastic member 130 enters the bore of the lap-roller $7''$ as shown in Figs. 16 and 17, thereby supporting the lap-rollers $7''$ . . . 7^n and preventing them from falling. When the magazine swings back to the normal position the hook of the elastic member 130 falls into the recess 131 and is disengaged from the bore of the lap-roller $7''$ which, at this time, will be supported by the stopper 132.

The new lap-roller $7'$ now discharged from the magazine falls on and between the lap-forming rollers 5 and 6. Upon further upward movement of the supporting bars 10 and 11 the magazine 54 continues to swing further with the result that its lower end strikes and expels the complete lap as well shown in Fig. 10.

As shown in Fig. 11 the lap-roller is provided on its circumference with a plurality of recessed portions 133 on which are set large numbers of hitching spicules 134 in such a manner that they do not extend outwardly beyond the exterior surface of the roller. As soon as the fresh lap-roller $7'$ is delivered to the lap-forming position the normal operation of the machine commences. The leading end of the fiber material is fed below the lap-roller and wrapped around it, the end of the fibre material being engaged by said hitching spicules 134 as shown in Fig. 12, thereby starting the new lap-forming operation.

The rapid rotation of the lap-forming rollers 5 and 6, the rapid rising of the supporting bars 10 and 11, and swinging movement of the magazine 54 are all caused by the movement of the actuating plate 86 and rotatable case 72 which movement is discontinued when the rotatable case is rotated half a revolution as described hereinbefore. As soon as the half revolution of said rotatable case is ended the supporting bars 10 and 11 which have been lifted to a predetermined height will begin to descend due to gravity and with the aid of the spring 122 connected at one end to the arm 120 and

at the other end to the frame of the machine. In this case the pawl **118** will merely slide on the teeth **119** on the bar **110** and will not distrub the downward movement of said bar. It will be understood that upon disengagement of the pawl **118** from the teeth **119** the magazine **54** swings back to the normal position. With the downward movement of the bars **10** and **11** the outwardly extending shaft **9** of the press-roller **8** will press down a side lever **135** the end of which is pivotally to the frame of the machine at **136** as the fulcrum. In this way the vertical rod **58** connected at its upper end with said lever **135** is pressed down so that the brake-lever **38** is disengaged from the hook **60** and the switch **64** is opened, thereby deenergizing the magnet **66**. The press-roller **8** continues to move downwards because the brake-lever **38**, at this stage, is in engagement with the projection **61** of the lever **62** as shown by the dotted line in Fig. 19 so that braking force is not yet applied to the brake-wheels. Then, the lever **135** is further pressed down and accordingly the vertical rod **58** is also pushed down against the action of the spring **59** so that the lever **62** is pushed outwardly by a projection **137** on the rod **58** and consequently the brake-lever **38** is disengaged from the projection **61** and descends to its normal position due to its own weight, thereby applying the braking force to the brake-wheel.

Apart from the above the descending lever **135** will contact a switch **138** mounted on the frame of the machine, thereby breaking the current to the magnet **53** so that the plunger **55** returns to the normal position and engages the projection **57**. As mentioned above the magnet **66** for the actuating plate **86** is deenergized and accordingly the plunger **87** also returns to the normal position. The switch **138** will however be soon closed because the press-roller **8** will again ascend with the increase of the diameter of the new lap so that the pressure of the lever **135** is released. Btu it should be understood that no action is started due to the closing of the switch **138** because, prior to this, the contacts **52** of the switch **50** are opened by the rotation of the cam **48** as shown by the full line in Fig. 3.

It will be understood from the above that all the operations mentioned above are automatically and continuously cycled so that fibre laps may be formed continuously without stopping the machine and requiring no manual labor.

While the invention has been described in connection with a particular embodiment thereof, it is to be understood that we do not limit ourselves to the precise method and construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention or the limits of the appended claims.

We claim:

1. In an automatic and non-stop operated fibre lap forming machine of the type having a plurality of calender rollers, a pair of fluted lap-forming rollers and a lap roller which is rotated on and by contact with said rotating lap-forming rollers and upon which is wound fibre material continuously fed through said calender rollers, the combination of a positively rotated press-roller positioned on and in contact with the lap, a pair of bars rotatably supporting said press-roller and having racks thereon, a brake shaft, gears secured thereon meshing with said racks, a brake drum mounted on said brake shaft, a brake lever for said brake drum, means to release the brake lever instantly when a predetermined length of fibre material is wound upon said lap roller, a ratchet wheel loosely mounted on said brake shaft and continuously rotated from a source of power, a ratchet wheel secured to said brake shaft, a cylindrical rotative case loosely fitted on said brake shaft, pawls secured to said case in engagement with said ratchet wheels respectively, restraining means within said case for normally holding said pawls inactive with respect to the respective ratchet wheels and including a projection extending outwardly of said case, an electro magnet, a plunger actuated by said magnet and normally engaging with said projection, and an electric switch positioned adjacent said brake lever releasing means and actuated by said brake lever releasing means to complete a circuit connected to said magnet, whereby when the brake is released the switch is closed to energize the magnet, the plunger is drawn by said magnet out of engagement with the projection so that said restraint of the pawls is released and the pawls engage the respective ratchet wheels, the brake shaft is rotated and the bars with the press-roller are rapidly raised thereby.

2. In an automatic and non-stop operated fibre lap forming machine of the type having a plurality of calender rollers, a pair of fluted lap-forming rollers and a lap roller which is rotated on and by contact with said rotating lap-forming rollers and upon which is wound fibre material continuously fed through said calender rollers, the combination of a positively rotated press-roller positioned on and in contact with the lap, a pair of bars rotatably supporting said press-roller and having racks thereon, a brake shaft, gears secured thereon meshing with said racks, a brake drum mounted on said brake shaft, a brake lever for said brake drum, means to release the brake lever instantly when a predetermined length of fibre material is wound upon said lap roller, a ratchet wheel loosely mounted on said brake shaft and continuously rotated from a source of power, a ratchet wheel secured to said brake shaft, a second ratchet wheel loosely mounted on said brake shaft, a gear loosely mounted on said brake shaft to which said second ratchet wheel is connected, gearing drivingly connecting said loosely mounted gear to the shaft of the lap-forming rollers, a cylindrical rotative case loosely fitted on said brake shaft, pawls secured to said case in engagement with said ratchet wheels respectively, restraining means within said case for normally holding said pawls inactive with respect to the respective ratchet wheels and including a projection extending outwardly of said case, an electro magnet, a plunger actuated by said magnet and normally engaging with said projection, and an electric switch positioned adjacent said brake lever releasing means and actuated by said brake lever releasing means to complete a circuit connected to said magnet, whereby when the brake is released the switch is closed to energize the magnet, the plunger is drawn by said magnet out of engagement with the projection so that said restraint of the pawls is released and the pawls engage the respective ratchet wheels, the brake shaft is rotated and the bars with the press-roller are rapidly raised thereby, and at the same time the lap forming rollers are rapidly rotated through said gearing.

3. In an automatic and non-stop operated fibre lap forming machine, the combination as claimed in claim 1 and a second electro magnet positioned at a point diametrically opposite the first mentioned magnet with respect to said cylindrical rotative case, a second plunger actuated by said second magnet, said magnets being electrically connected to be energized alternately by the close of said switch positioned adjacent said brake lever releasing means, whereby the rotation of said rotative case caused by the disengagement of said projection from one of the plungers is discontinued half way through a complete rotation by engagement of said projection with the other plunger, which engagement causes disengagement of the pawls from the respective ratchet wheels.

4. In an automatic and non-stop operated fibre lap forming machine, the combination as claimed in claim 1 in which said brake lever releasing means comprise a vertical rod having a hook for engagement with the brake lever, a cam projection provided on said rod, a lever positioned adjacent the end of the lever and having a head in pressed contact with said cam projection, a spring

pressing said head against said projection, a projection provided on said lever and normally in pressed contact with the extremity of said brake lever, said projection on the lever entering below the brake lever when the vertical rod moves upwardly, said cam projection adapted to push said lever outwardly when the vertical rod moves downwardly, thereby disengaging the projection from the brake lever.

5. In an automatic and non-stop operated fibre lap forming machine, the combination as claimed in claim 1 and teeth provided on one of the said bars, a magazine in which is stored a supply of empty lap-rollers, a linkage system one end of which is connected to said magazine and the other end of which is provided with a pawl, a second linkage system connecting said pawl and the brake lever and adapted to push the pawl forwardly when the brake is released, whereby said pawl engages with the teeth of the rising bar and the magazine is swung forwardly, means on said magazine to deliver a fresh empty lap roller to the lap forming position as said magazine is swung forwardly, said forward swinging expelling the completed lap by kicking it out at the lower end of the magazine.

6. In an automatic and non-stop operated fibre lap forming machine, the combination as claimed in claim 5, and a stopper projecting from the frame of the machine

and normally engaging with the lowermost or bottom empty lap roller in said magazine preventing said lap roller from falling, an elastic hook provided on said magazine, and a recess formed on the frame of the machine for normally receiving said hook to keep it inactive on any of the lap rollers, the depth of said recess decreasing in the direction of swinging movement of said magazine, whereby when the magazine is swung forwardly the lowermost lap roller is disengaged from said stopper and discharged to the lap forming position while at the same time the elastic hook is urged into the bore of the next lap roller in said magazine by said recess to prevent said next lap roller from falling.

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