March 27, 1934. D. B. MACDONALD 1,952,177

SKIVING MACHINE

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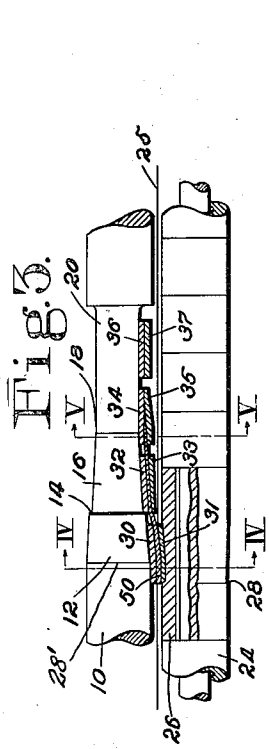


Fig. 3.

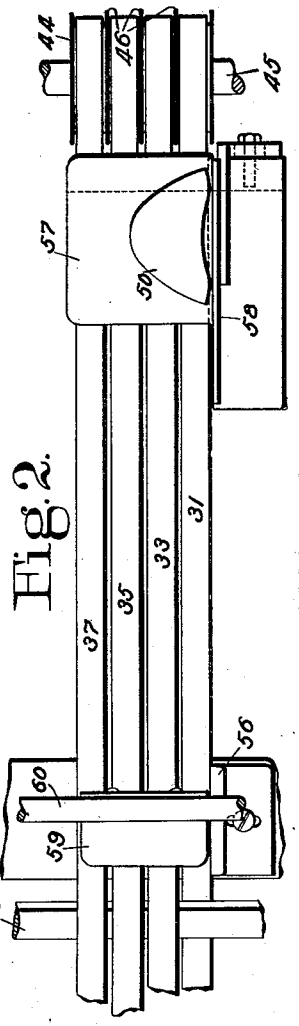


Fig. 2.

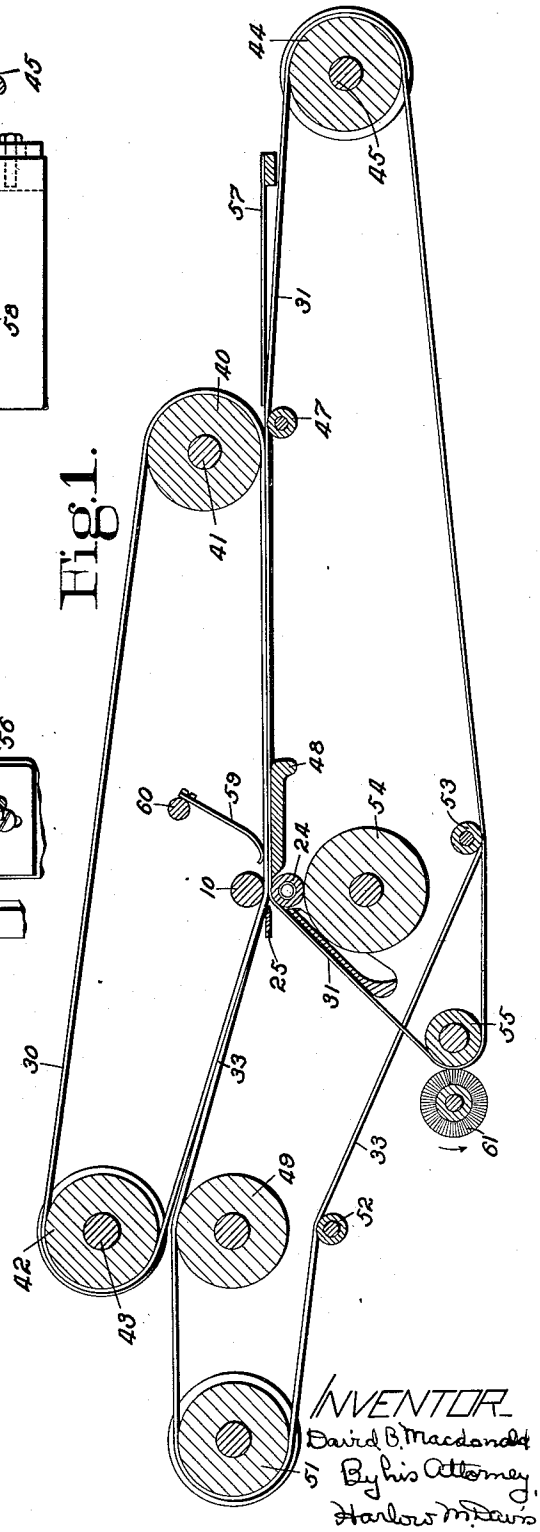


Fig. 1.

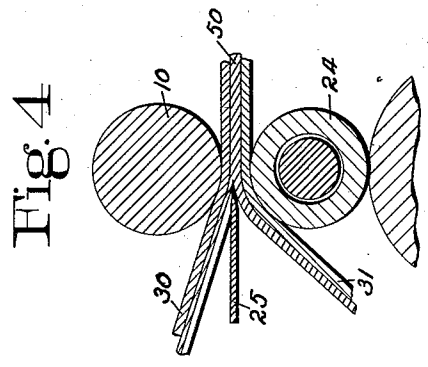


Fig. 4

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Fig. 5

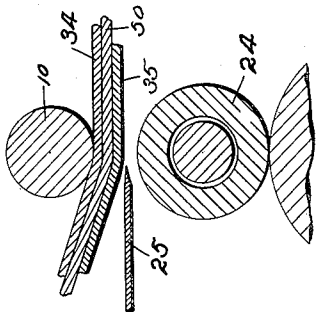


Fig. 7.

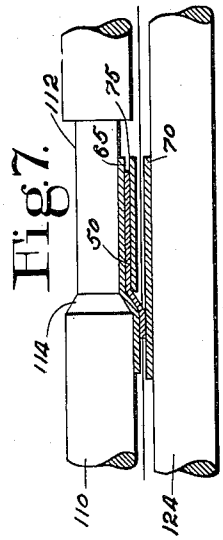


Fig. 8.

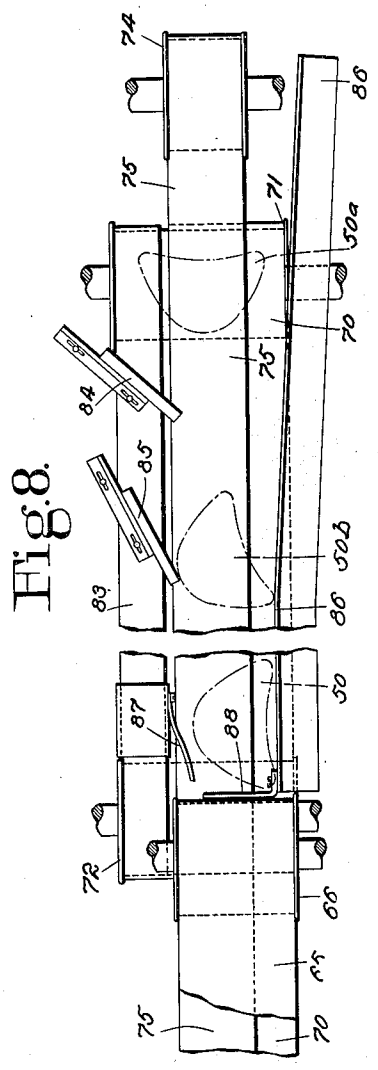


Fig. 6.

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UNITED STATES PATENT OFFICE

1,952,177

SKIVING MACHINE

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Application August 10, 1931, Serial No. 556,127
In Great Britain August 30, 1930

30 Claims. (Cl. 12—63)

This invention relates to machines for skiving articles made of sheet material and is herein illustrated as embodied in a machine particularly well adapted to skive the margins of shoe stiffener blanks which have just been impregnated with a stiffening substance and are limp and soft.

In the manufacture of toe-stiffeners of a certain type it is customary, as disclosed in United States application Serial No. 533,373, filed April 27, 1931, now Patent No. 1,895,467, granted January 31, 1933, in my name first to cut out suitably shaped fabric bases, then to impregnate them with a colloidal stiffening substance in solution, then to skive their rear margins, and finally to pack them in air-tight containers, this whole process being a continuous one so that the stiffeners are still limp and soft when they are placed in the container and remain in this condition until the container has been shipped to a shoe factory and is opened for the immediate incorporation of the stiffeners in shoes.

The skiving of the margins of such blanks presents certain difficulties because of the soft condition of the stiffening substance and the presence of more or less of the solvent liquid. When such blanks are skived on a machine of the usual construction, comprising a pair of cylindrical feed rollers and a knife, it is necessary to cause the rollers to exert considerable pressure in order to feed the blanks to the knife; and this considerable pressure, momentarily localized, as it is, on a small area of the blank at the bite of the rollers, is liable to squeeze out of the blanks some of the impregnating substance.

According to one feature of the invention the blanks are gripped between superposed bands and fed between suitably shaped rollers to the knife in such manner that the blanks are bent during the skiving operation and a skiving is removed from one margin thereof. In the illustrated machine the body portion of each blank is gripped by bands which engage both sides including most of the body portion of the blank, and another band engages the margin on that side from which the skiving is to be removed. All of these bands pass between the rollers and hold the blank properly during the skiving operation. The band which engages the marginal portion passes under the knife so that the skiving may separate from the blank, while the bands which engage the body portion of the blank pass over the knife and maintain their grip on the blank until they have carried it to a point of delivery. By making use of bands in the manner described the blanks are held firmly but without excessive pressure during the skiving operation and may be skived rapidly without danger of expelling from them any considerable amount of the soft impregnating substance.

This and other features of the invention will be described as embodied in an illustrated machine and pointed out in the appended claims.

Referring now to the accompanying drawings, which are mainly diagrammatic,

Figure 1 shows in side elevation and partly in section an arrangement of band feeding means applied to a band knife skiving machine;

Figure 2 is a plan view of part of the mechanism of Figure 1;

Fig. 3 shows in elevation and on an enlarged scale parts of a pair of rollers of the machine of Figure 1 with work conveying bands and a workpiece passing between the rollers;

Figure 4 shows a section, on a still larger scale, on the line 4—4 of Figure 3;

Figure 5 is a similar section on the line 5—5 of Figure 3;

Figure 6 is a view, similar to Figure 1, of alternative band feeding devices;

Figure 7 is a view, similar to Figure 3, showing a construction of rollers suitable for employment with the band feeding devices of Figure 6; and

Figure 8 shows in plan work feeding devices suitable for employment with the devices of Figure 6.

The illustrated machine comprises a band knife 25 and feed rollers 10, 24, the upper roller 10 being solid and the lower roller 24 having a series of independently yieldable sections supported by a rubber roller 54. The mounting of the sections of the lower roller and the mechanism for driving the rollers and the knife have not been shown since these parts of the machine are of an old and well-known type.

In order to cause a stiffener blank to be skived along one margin thereof, the two rollers have suitable contours. To this end, according to the construction shown in Figures 1 to 5 inclusive, the top roller 10, when viewed from the front of the machine as shown in Figure 3, has formed on it towards its left-hand end a tapered portion 12 tapered down towards the right from its normal diameter. At the right hand or small end of the tapered portion 12 there is formed a small shoulder 14 by further reduction in diameter of the roller. From the shoulder 14 the reduced portion is tapered towards the right to the point 18. From the small end of this tapered portion 16 the roller is made cylindrical, as indicated at 20.

The roller 10 for the remainder of its length is then of its normal diameter.

The lower roller 24 which, as has been stated, is sectional has three of the usual sections of such a roller replaced by a single section 26. This section 26 has at its left-hand end a cylindrical portion. At the right-hand end of this portion is a shoulder 28 formed by reducing the diameter of the section slightly. The section 26 is cylindrical from the shoulder 28 for a short distance toward the right to a point directly beneath the line 28' on the upper roller which marks the beginning of the tapered portion 12 of the upper roller. From this point beneath the line 28', the section 26 gradually increases in diameter to a point beneath the line 14 which marks one end of the tapered portion 16 of the upper roller, the remainder of the section 26 being cylindrical. It will be noted that the portion of the upper roller between the lines 28' and 14 is tapered to the right while the portion of the lower roller directly beneath it is tapered to the left so that the faces of these two portions are substantially parallel to each other at the bite of the rollers.

Blanks are fed, one at a time, to the rollers 10 and 24 and band knife 25 (its cutting edge being indicated by a single line in Figure 3) and out of the machine between and by endless thin bands. These bands are in two series, an upper and lower series, and each series comprises preferably, as shown by Figures 1 and 2, four bands. The bands (which are all of the same thickness and width) are preferably made of close woven inextensible webbing and are spaced small distances apart. The upper series of bands designated by even numbers 30, 32, 34, and 36 passes round a roller 40 at the front of the machine which is fixed on a horizontal shaft 41 extending across the machine and freely rotatable in bearings on the machine frame. The shaft 41 is in front of the rollers 10 and 24, and the bands as they pass from the lower side of the roller 40 to the rollers 10, 24 are substantially horizontal. These upper bands pass under and in contact with the upper roller 10 of the skiving mechanism above the band knife 25, and then pass upwardly and rearwardly to a second roller 42 fixed on a horizontal shaft 43, extending across the machine, which is rotatably mounted in bearings on the machine frame and is driven by suitable means not shown. The roller 42 is behind the rollers and above the bite of the rollers and is provided with grooves to receive the bands and keep them separated laterally. The bands pass back over the top of the machine from the roller 42 to the front roller 40 which is also provided with band-spacing grooves.

The bands of the lower series, designated by the odd numbers 31, 33, 35 and 37, are respectively directly below the corresponding bands of the upper series and pass at the front of the machine round a roller 44 fixed on a horizontal shaft 45 extending across the machine and freely rotatable in bearings on the machine frame. This roller has flanges 46 separating grooves which receive the bands and keep them properly separated. The shaft 45 is in front of the rollers 10, 24 and the lower bands, as they pass from the upper side of the roller 44, pass slightly upwardly and over a freely rotatable roller 47 which is below and slightly in front of the front roller 40 of the upper series of bands. From the roller 47 the lower bands pass below, and substantially in contact with the upper bands, over a feed table 48 and between the rollers 10, 24. The three bands 33, 35 and 37 pass over the band knife as shown in Figure 2. After passing over the knife the said three bands pass over a freely rotatable horizontal guide roller 49 positioned directly below the rear guiding roller 42 and at such a distance below the latter roller that the lower bands, as they pass rearwardly and upwardly to the guide roller 49, separate gradually from the upper bands. The three lower bands 33, 35 and 37 then pass over and round a driven roller 51 which is behind and on a level with the guide roller 49. The roller 51 has, like the roller 44, flanges and grooves to receive the lower bands and keep them spaced; and, after passing round the roller 51, the three lower bands return to the roller 44 at the front of the machine. In returning to the roller 44 the three lower bands are guided by suitable freely rotatable rollers 52 and 53 and pass below the rubber roller 54 of the machine which supports the sections of the roller 24. The band 31 of the lower series passes over the sectional roller 24 and downwardly under the band knife 25. At the rear of and below the rubber roller 54 the band 31 passes round a freely rotatable guide roller 55 and then joins the three other bands of the lower series as they travel back to the front guiding roller 44.

As the bands pass between the rollers 10 and 24, the outer edges of the bands 30 and 31 are in alignment with the shoulder 28 on the section 26 of the lower roller 24, the band 31 being engaged by the reduced cylindrical portion and adjoining tapered portion of the section 26 of the lower roller and the band 30 by the tapered portion 12 and part of the adjoining cylindrical portion of the upper roller 10 so that these two bands are bent laterally somewhat. The adjoining edges of the next pair of bands 32 and 33 are in alignment with the shoulder 14 formed on the upper roller, the other two pairs of bands 34, 35, and 36, 37 being spaced apart along the rollers. The feed table 48 has fixed to it so as to be adjustable across the machine a guide 56 to guide the outer edges of the bands 30 and 31 to the shoulder 28 of the lower roller.

With the above arrangement of bands, blanks such as the toe stiffener blank 50 shown in Figures 2, 4 and 5, are fed to the bands (all of which latter are caused to travel at the same speed) from a platform 57 fixed to the frame of the machine and extending over the lower bands where they project forwardly of the upper bands. The platform has fixed to it an edge gauge 58, Figure 2, which may be adjusted laterally of the bands and this gauge is preferably set in vertical alignment as shown with the outer edges of the bands 30 and 31.

The bands and blanks, as they pass over the feed table of the skiving mechanism, are pressed together and to the table by a presser member 59 in the form of a curved spring plate which is fixed to a horizontal shaft 60 extending across the machine above the table. The shaft 60 may be rotated to adjust the pressure of the plate on the bands, the plate exerting thus a yielding pressure upon the upper bands just in front of the rollers.

Blanks to be skived, for example the toe stiffener blank shown at 50 Figure 2, are fed by hand one after another from the platform 57, with their rear margins (i. e. their margins remote from their tone ends), which are to be skived, against the edge gauge 58 and therefore with their rear edges in line with the left-hand edges (Fig. 3) of the left-hand pair of bands 30 and 31.

The bands then grip the blanks by both faces over the full area of the blank, except for the small spaces between bands, and carry the blanks in succession first over the feed table 48, where the bands are pressed together by the spring plate 59, and then to the bite of the rollers 10 and 24 and against the band knife 25.

Owing to the special formation given, as described, to the upper roller 10 and, the substantially complementary form given to the lower roller 24, the left-hand or rear margin only of the blank (Fig. 3) is presented to the band knife by the bands 30 and 31, as shown in Figure 4, the remainder of the blank being carried completely above the knife by the other bands, as shown in Figure 5. With the formation of the upper roller and sectional roller above described, the margin of the blank near its edge is reduced to a uniform thickness, and the margin, from the inner edge of the split, is skived or tapered up to the full thickness of the blank. Owing to the fact that the extreme margin at the rear end of the blank is gripped between cooperating cylindrical portions of the upper and lower rollers (see Figure 3) which hold it horizontal while the adjacent portion toward the toe end of the blank is gripped between cooperating tapered portions which bend it upward on an incline, the horizontal knife 25 passes through the blank as shown. There is then produced a finished blank which is of a uniform thickness a short distance in from its rear edge. The blank as it is skived is carried up over the band knife and out of the machine between the three pairs of bands 32, 33, 34, 35 and 36, 37 which retain their firm grip on the blank until it is wholly clear of the knife. The skived-off pieces are carried down below the knife 25 by the band 31 and are removed from this band by a driven rotary brush 61, Figure 1, which engages the band 31 where it passes round the guide roller 55, the bristles of the brush being moved in a contrary direction, where they contact with the band, to the direction of movement of the band.

Instead of a series of four upper bands and another series of four lower bands as described above, a single wide upper band of the same overall width as the whole upper series may be employed together with only two lower bands one precisely similar in location and function to the left hand lower band 31 but approximately equal in width to the single upper band, and the other of the overall width of and functioning in place of the three lower bands 33, 35 and 37, in the arrangement above described. A modified form of band feed in which as last indicated wide bands are used is shown in Figures 6, 7 and 8. In this modified arrangement a wide upper band 65 runs over rollers 66 and 67 which correspond to the rollers 40 and 42 above described. The band 65 may be kept tensioned by a spring pressed idle roller 68.

A main lower wide band 70 runs over rollers 71, 72 and 73 corresponding respectively to the rollers 44, 47 and 55 above described. A narrower supplementary or carrier band 75 is arranged to run outside the band 70 and, in the same way as the bands 33, 35 and 37 above described, passes above the band knife and over in this instance two rollers 76 and 77 which replace the roller 51 above described, being kept tensioned by a spring pressed idle roller 78. The main lower band 70 is kept tensioned by passing over a spring pressed idle roller 79 in addition to traversing guiding rollers 80 and 81. The band 75 is guided independently of the band 70 at the entry end of the band feeding device by a roller 74.

In this construction, as shown in Figure 7, the rollers adjacent the knife may be somewhat simplified in construction as compared with that previously described. The lower roller 124 is made plainly cylindrical without separate sections and is no longer supported by a rubber roller.

The upper roller 110 is of full diameter except for a mid portion 112 where it is reduced in diameter. At one end the reduced portion 112 merges into the part of full diameter by a tapered portion 114.

In this construction it is convenient to provide side guides indicated by the dotted line 89 in Figure 6, above the table 48 to maintain the bands 65 and 75 in desired alignment relatively to the roller 110.

The two main bands 65 and 70 are guided by the other rollers and the side guides 89 so as to run relatively to the rollers 110 and 124 so that, as shown in Figure 7, their right hand edges are located about half an inch from the shoulder at the end of the reduced portion 112, their left hand edges overlapping the full portion of the roller 110 by approximately one inch.

A blank when it reaches the position of the blank 50 (Figure 8) will have its main portion resting upon the band 75 and its rear margin unsupported by this band and projecting over the band 70. When it has moved a little farther to the left, the band 65 will press the main portion of the blank against the band 75 (Figure 7) beyond which the rear margin of the blank projects, and will press the margin of the blank against the band 70; and the blank will remain in this bent shape as the knife 25 skives it. The skived-off portion of the blank will be carried away downwardly below the knife by the band 70, being removed as in the construction previously described by a driven brush 61 which, in this construction, brushes only that marginal portion of the band 70 which projects laterally clear of the band 75.

Following their being skived on passing the knife 25, blanks are maintained gripped between the bands 65 and 75, the roller 76 being positioned so as to keep the two bands in contact until the band 75 passes around it. As the two bands 65 and 75 part company, a blank gripped by them will be released, having travelled from the skiving point with its skived margin unsupported. When the grip on the unskived portion ceases, it is desirable that the skived portion should receive some support to avoid the blanks shifting undesirably upon the band 75. To prevent any such shifting and to aid towards ensuring that each blank drops in the same position from the band 75 as that latter passes on to the underside of the roller 77, it is convenient to provide a narrow band 82 which passes merely around the two rollers 76 and 77 at that side of the band 75 beyond which the skived edge projects.

Apparatus as shown in Figure 8 may be employed to guide blanks into proper position for skiving. If toe stiffener blanks are deposited one by one on the bands 70, 75 for instance by a conveyor, with their toe ends leading, as indicated by the position of the blank 50*a* in Figure 8, it is necessary for each blank to be swung through 90° before it reaches the band 65 if its rear margin is to be skived. In order to afford better support for the blanks when they are in the posi-

tion occupied by the blank 50*a* and while they are being swung through 90° and carried to the point at which their upper faces are engaged by the band 65, an additional narrow band 83 may be provided which runs over the rollers 71, 72 and is in effect a widthwise extension of the band 75. In order to swing the stiffeners through 90°, adjustable deflectors 84 and 85 extend over the narrow band 83 and over part of the band 75 in position to engage the moving stiffeners and swing them as shown in Figure 8. A blank shown at 50*b* is engaging the deflector 85. The margin of each blank opposite to that engaged by the deflectors is limited and controlled in movement by an edge guide 86 which has a guiding edge, the main portion of which is located at a small angle to the line of the bands and part of which near the roller 72 lies parallel to the band line. A spring finger 87 may be employed to ensure that the blank margin which is to be skived is in contact with the edge guide 86 as the blank passes to the point at which it is gripped between the bands 65, 75. A guard 88 under which blanks pass acts to prevent any blank that has become bent or folded by accident, or the fingers of an operator from getting between the rollers 66 and 72.

With the construction of bands and rollers 110 and 124 last described it will be appreciated that the portion 112 of the roller 110 is reduced sufficiently to provide passage space above the knife of the two bands 65, 75 as well as the blank.

The machine of the present invention, as has been stated, is particularly adapted to the skiving of stiffener blanks which have just been impregnated with a solution of celluloid or some similar substance. In this condition the blanks are very soft and limp, and same of the impregnating substance may readily be squeezed out of them. The present machine is particularly designed to avoid such undesirable result. Prior to the time that the blanks enter the skiving mechanism they are gripped comparatively lightly between the bands. As they enter the skiving mechanism the pressure with which they are gripped increases gradually as compared with what its rate of increase would be if the bands were not present and the blanks were fed to the rolls of an ordinary skiving machine. By the use of bands there is secured first a gradual flattening of the blank and then a firm gripping of the blank until the skiving is completed without squeezing any impregnating substance out of the blank such as would be liable to occur if an ordinary skiving mechanism were used. The gradual application of pressure to the blanks as they enter the skiving mechanism is due in large part to the action of the bands, but is due in part also to the action of the pressers 59.

Such a skiving machine with either one of the band arrangements indicated, lends itself well for use in skiving freshly impregnated blanks since its ability to skive such blanks, in spite of their soft condition, and without any handling, ensures steady progress of the blanks from the impregnating apparatus to the containers in which they are to be sealed.

Moreover the use of a band feed arrangement as described admits of obtaining readily a multiplication of output capacity, since two, three or more such band arrangements may be provided "in parallel" to feed blanks respectively to different skiving stations spaced apart along one and the same knife.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of members the distance apart of the adjacent portions of which is different at different localities along the members and always the same at any given locality along the members, and a plurality of bands for gripping the blank and carrying it between the members to the knife.

2. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of members the distance apart of the adjacent localities of which is different at different localities along the members, a plurality of bands for gripping the blank and carrying it between the members to the knife, and means for causing a cooperating pair of bands to maintain their grip upon the blank after it has been skived, to carry the blank to a locally remote from the knife and there to release the blank.

3. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers the distance apart of the adjacent elements of which is different at different localities along the rollers and always the same at any given locality along the rollers and a plurality of bands for gripping the blank and carrying it between the rollers to the knife.

4. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers the distance apart of the adjacent elements of which is different at different localities along the rollers, a plurality of bands for gripping the blank and carrying it between the rollers to the knife, and means for causing a pair of the bands to maintain their grip upon the blank after it has been skived, to carry the blank to a locality remote from the knife and there to release the blank.

5. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers one of which has a cut-away portion, a pair of bands for engaging both sides of the body portion of the blank, a band for engaging the margin of the blank on that side from which the skiving is to be removed, and means for leading the bands between the rollers, for leading the pair of bands over the knife and for leading the margin-engaging band under the knife.

6. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers, one of which has a cut-away portion entirely around the periphery of the roller, and a plurality of bands running between the rollers and adapted to grip the blank during the skiving operation, one of said bands running partly in said cut-away portion and partly on the portion which is not cut away whereby said band is bent transverse to its widthwise dimension.

7. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers, one of which has a cut-away portion, a plurality of bands running between the rollers and adapted to grip the blank during the skiving operation, and means for causing selected bands to maintain their grip upon the blank after the skiving operation and to carry the skived blank to a locality remote from the knife.

8. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers, one of which has a cut-away

portion, a plurality of bands running between the rollers and adapted to grip the blank during the skiving operation, and means for causing selected bands to maintain their grip upon the blank after the skiving operation with gradually decreasing pressure and to carry the skived blank to a locality remote from the knife.

9. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers one of which is provided with a tapered portion, and a plurality of bands passing between the rollers one of which is bent transverse to its widthwise dimension on contact with said portion.

10. A machine for removing a skiving from the margin of a blank having in combination a knife, a series of at least three bands adapted to grip the blank and carry it past the knife, and means for causing two of the bands to maintain their grip upon the skived blank after it has passed the knife until they reach a locality remote from the knife and there to release the blank and for causing another band to carry the chip or skiving away from the skived blank.

11. A machine for removing a skiving from the margin of a blank having in combination a knife, a series of at least three bands adapted to grip the blank and carry it past the knife, means located adjacent to the knife for bending the margin of the blank transverse to the widthwise dimension of the bands into the plane of the knife while the blank is gripped by the bands, and means for causing two of the bands to maintain their grip upon the skived blank after it has passed the knife until they reach a locality remote from the knife and there to release the blank.

12. A machine for removing a skiving from the margin of a blank having in combination a knife, a series of at least three bands adapted to grip the blank by engaging both sides thereof including the portion to be skived and carry it past the knife, and means for causing two of the bands to decrease their grip upon the skived blank progressively beginning immediately after the blank has passed the knife and continuing until they reach a locality remote from the knife and there to release the blank.

13. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of bands for engaging both sides of the body portion of the blank, a band for engaging the margin of the blank on the side from which the skiving is to be removed, means for leading the pair of bands over the knife, and means for leading the last-named band under the knife.

14. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of bands for engaging both sides of the body portion of the blank, a band for engaging the margin of the blank on the side from which the skiving is to be removed, means for moving the bands in substantially parallel paths to feed the blank to the knife, and means for causing the path of the pair of bands and that of the margin-engaging band to diverge after the bands have passed the knife.

15. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers provided with complementary tapered portions, and a plurality of bands passing between the rollers and adapted to be bent widthwise by contact with said portions.

16. A machine for removing a skiving from the margin of a blank having in combination a knife, and means for feeding a blank to and past the knife, said means comprising a pair of superposed endless bands both located on one side of the knife for gripping the body portion of the blank, and a second pair of superposed endless bands one located on one side and the other on the other side of the knife for gripping the margin of the blank, the first-mentioned pair of bands being constructed and arranged to maintain their grip on the body portion of the blank after the bands have passed the knife.

17. A machine for removing a skiving from the margin of a blank having in combination a knife, and means for feeding a blank to and past the knife, said means comprising a pair of superposed endless bands for gripping the body portion of the blank, a second pair of superposed endless bands for gripping the margin of the blank and a pair of members located adjacent to the knife between which both pairs of bands pass, said members being shaped to distort transverse of their widthwise dimension the bands which grip the margin of the blank and with them said margin during the skiving operation.

18. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of superposed bands for engaging the body portion of the blank, a second pair of superposed bands for engaging the margin of the blank, means for moving the bands to feed the blank to the knife, and means for causing the margin-engaging pair of bands to separate after the skiving operation and for causing the body-engaging pair of bands to maintain their grip upon the blank.

19. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers having a suitably shaped opening between them, a pair of superposed bands for engaging the body portion of the blank, a second pair of superposed bands for engaging the margin of the blank, means for moving the bands to feed the blank between the rollers to the knife, and means for causing the margin-engaging pair of bands to separate after the skiving operation and for causing the body-engaging pair of bands to maintain their grip upon the blank.

20. A machine for removing a skiving from the margin of a blank having in combination a knife, and means for feeding a blank to and past the knife, said means comprising a moving endless band having a substantially straight run upon which a blank may be placed, a second moving endless band narrower than the first and having a substantially straight run between which and the first-named run the body portion of the blank is gripped with its margin projecting beyond an edge of the second-named run, and a third moving endless band having a substantially straight run between the margin of which and the first-named run the margin of the blank is gripped.

21. A machine for removing a skiving from the margin of a blank having in combination a knife, and means for feeding a blank to and past the knife, said means comprising a moving endless band having a substantially straight run upon which a blank may be placed, a second moving endless band narrower than the first and having a substantially straight run between which and the first-named run the body portion of the blank is gripped with its margin projecting beyond an edge of the second-named run, a third moving endless band having a substantially straight run between the margin of which and the first-named

run the margin of the blank is gripped, and a member located adjacent to the knife shaped to bend one of the bands and with it the blank during the skiving operation.

22. A machine for removing a skiving from the margin of a blank having in combination a knife and three superposed bands for feeding the blank, the body portion of the blank being gripped between the upper and the middle band, and the margin from which the skiving is to be removed being gripped between portions of the top and the bottom bands.

23. A machine for removing a skiving from the margin of a blank having in combination a knife, three superposed bands for feeding the blank, the body portion of the blank being gripped between the upper and the middle band, and the margin from which skiving is to be removed being gripped between portions of the top and the bottom bands and a member located adjacent to the knife for bending the blank while it is being gripped by the bands during the skiving operation.

24. A machine for removing a skiving from the margin of a blank having in combination a knife, means for gripping the body portion of the blank and the margin from which the skiving is to be removed and feeding the blank to the knife, and means for releasing the grip on the margin at the end of the skiving operation while maintaining the grip upon the body portion to carry the blank to a point of delivery remote from the knife.

25. A machine for removing a skiving from the margin of a blank having in combination a knife, a pair of rollers one of which has a cut-away portion, and means for gripping the blank on both faces and for moving with it between the rollers to present the blank to the knife.

26. A machine for removing a skiving from the margin of a blank softened to a limp state by a stiffening solution having, in combination, a knife, a pair of members for bending the blank into a predetermined shape prior to its presentation to said knife, and means for gripping said blank and feeding it between said members to the knife, said means comprising a plurality of superposed endless bands constructed and arranged to grip the blank lightly so that substantially no solution will be expelled from the blank during the feeding and skiving operations.

27. A machine for removing a skiving from the margin of a blank softened to a limp state by a stiffening solution having, in combination, a knife, a pair of rollers one of which has a cut-away portion, a plurality of superposed bands for gripping the blank and feeding it between the rollers, said bands being positioned to grip the blank lightly so that substantially no stiffening solution will be expelled from said blank during the feeding and skiving operations, and means for causing two of the bands to retain a gradually decreasing grip on the blank after the skiving operation until they carry the blank to a locality remote from the knife.

28. A machine for removing a skiving from the margin of a blank softened to a limp state by a stiffening solution having, in combination, a knife, a pair of rollers shaped to bend a margin of the blank out of the plane of the body portion thereof prior to its engagement by the knife, a plurality of pairs of endless bands for feeding the blank between said rollers to the knife, the bands of each pair being so positioned as to grip the blank lightly to prevent loss of the solution from the blank during the feeding operation, and means adjacent to the rollers for causing the bands to exert yielding pressure on the blank prior to their entry between said rollers.

29. A machine for removing a skiving from the margin of a blank softened to a limp state by a stiffening solution having, in combination, a knife, a pair of rollers for causing the blank to assume a predetermined position prior to its engagement by the knife, a plurality of pairs of endless bands for feeding the blank between said rollers to the knife, and means for causing the bands to exert a light pressure on the blank so that substantially no solution will be expelled from said blank during the feeding operation.

30. A machine for removing a skiving from the margin of a blank softened to a limp state by a stiffening solution having, in combination, a knife, a pair of rollers for causing the blank to assume a predetermined position prior to its engagement by the knife, a plurality of pairs of endless bands for feeding the blank between said rollers to the knife, and a spring plate constructed and arranged to cause the bands to exert a light pressure on the blank insufficient to cause substantial loss of stiffening solution.

DAVID BAIRD MACDONALD.

CERTIFICATE OF CORRECTION.

Patent No. 1,952,177. March 27, 1934.

DAVID BAIRD MacDONALD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 147, for "tone" read toe; and page 4, line 96, claim 2, for "locally" read locality; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 19th day of June, A. D. 1934.

Bryan M. Battey

(Seal) Acting Commissioner of Patents.