May 10, 1960 W. E. WALKER 2,935,916

MACHINES FOR STRIPPING UNWANTED MATERIAL FROM CUT BLANKS OF CARDBOARD AND LIKE MATERIAL

Filed July 12, 1957

3 Sheets-Sheet 1

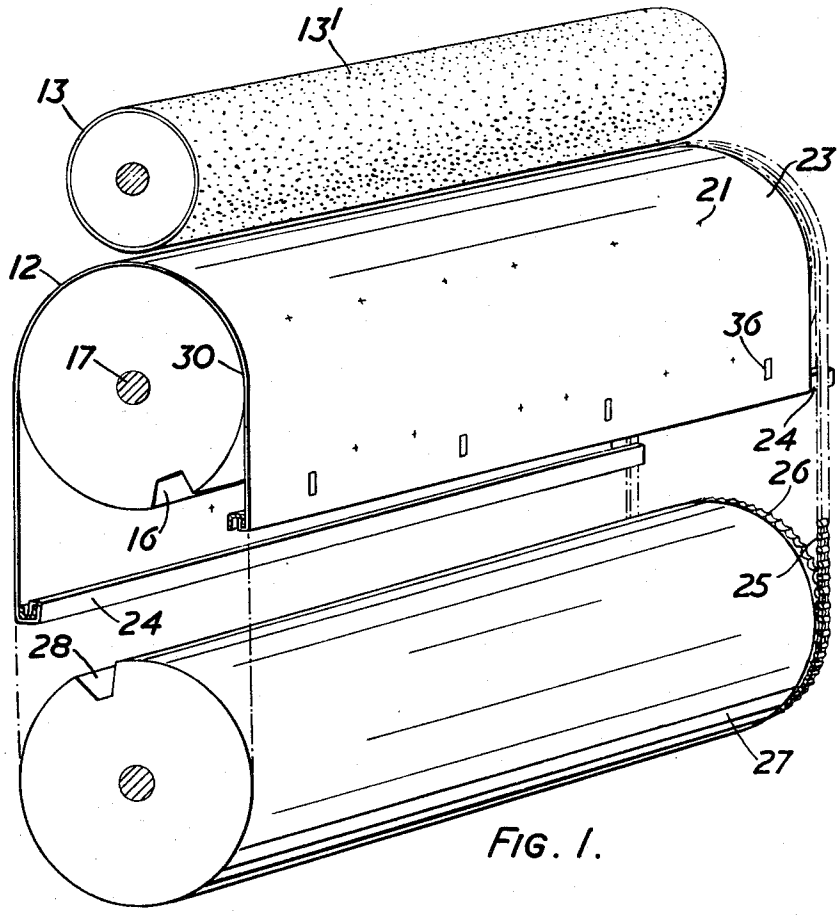


FIG. 1.

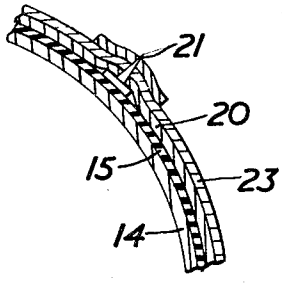


FIG. 4.

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3 Sheets-Sheet 2

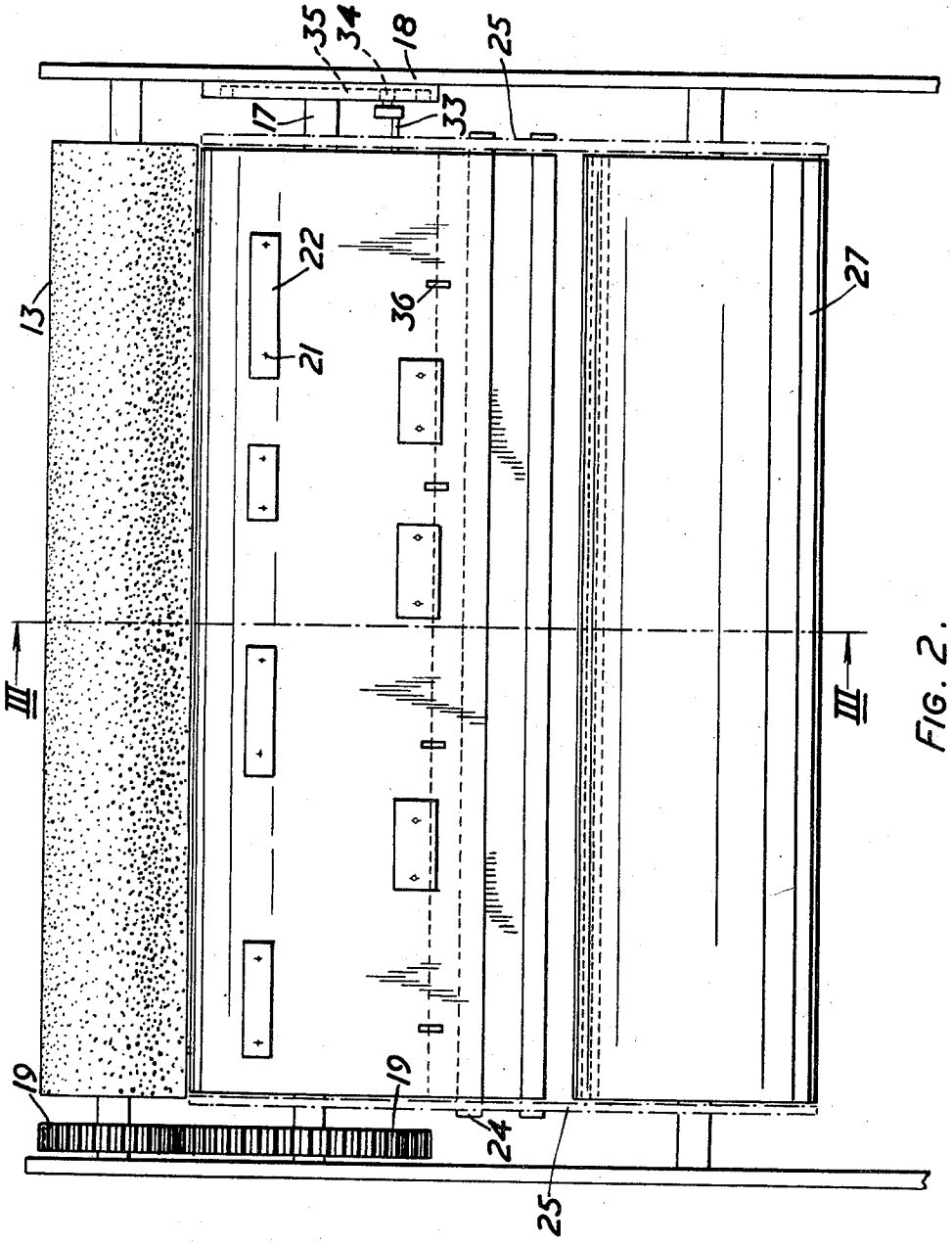


FIG. 2.

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Filed July 12, 1957 3 Sheets-Sheet 3

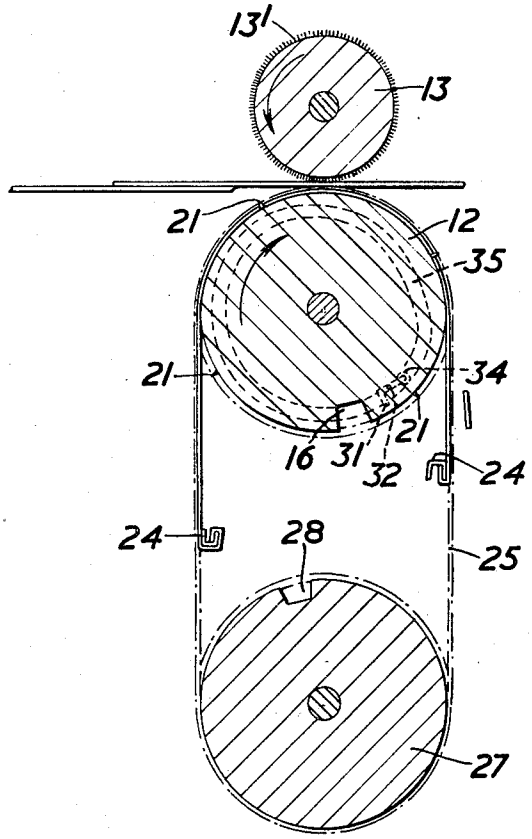


FIG. 3.

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2,935,916

MACHINES FOR STRIPPING UNWANTED MATERIAL FROM CUT BLANKS OF CARDBOARD AND LIKE MATERIAL

William Edward Walker, Enfield, England

Application July 12, 1957, Serial No. 671,500

Claims priority, application Great Britain July 20, 1956

6 Claims. (Cl. 93—36)

This invention relates to machines for stripping unwanted material from cut blanks of cardboard and like material either in separate sheets or a continuous web. In specification No. 2,778,286 I have described a machine for this purpose comprising two rollers between which the material to be stripped is fed. One roller carries pins so located that they pierce the unwanted material while the other roller has a surface adapted to receive the pins irrespective of the position of the pins. In order to remove subsequently the unwanted material from the pins, a comb was provided adjacent the first roller, the teeth of which engaged under the unwanted material and removed it from the pins. The pins themselves passed between the teeth of the comb.

Because of the necessity of passing between the teeth of the comb, the position in which the pins can be placed on the first or stripping roller are to some extent limited. This reduces the flexibility of the machine in stripping blanks of any pattern and occasionally results in imperfect stripping because the pins cannot be located at the places suitable to pierce unwanted material properly.

An object of this invention is to provide improved means for removing unwanted material from the pins.

According to the invention, a stripping machine for the purpose described comprises a pair of rollers between which the blanks are fed, the first roller being adapted to have outwardly directed pins secured thereon at locations such that the pins pierce unwanted material of the blanks and the second roller having a surface adapted to receive the pins, and means for supporting and driving a belt for removing unwanted material from the pins over a closed path which includes a part only of the periphery of the first roller including the bite of the rollers, at a peripheral speed substantially equal to the peripheral speed of the first roller.

The belt passes over the part of the first roller where it engages first with the blanks to be stripped and is pierced by the pins; the pierced unwanted material is thus held on the exterior of belt and when the belt subsequently leaves the surface of the first roller, the belt is withdrawn from the pins thereby automatically removing the unwanted material from the pins.

The invention will be more readily understood by way of example from the following description of one form of stripping machine in accordance therewith, reference being made to the accompanying drawings, in which:

Figure 1 is a perspective view of the essential parts of the machine,

Figure 2 is a front view,

Figure 3 is a section on the line III—III of Figure 2, and

Figure 4 is an enlarged sectional view of part of the stripping roll.

Referring to the drawings, the machine comprises two co-operating rolls 12, 13 between which the material to be stripped is fed. The stripping roll 12 is a hollow steel cylinder 14 (Figure 4) having a rubber covering 15 and containing a gap 16 extending the full length across the

cylinder. The ends of the cylinder are closed and the cylinder is driven through the shaft 17 carried in the frame 18.

The second roll 13 is similar to the roll 13 of the above mentioned specification and has a covering of wire brush 13'. It is driven through the gearing 19 from roll 12.

Round the rubber covered surface of roll 12 is secured a tympan or pattern sheet 20 which is strong but is capable of being perforated at any point by pins 21. It is preferred to use strong paper for sheet 20 but sheet plastic, rubber cloth or wire mesh may alternatively be used. Pins 21 are headed and are located on the sheet 20 in such positions that, when the sheet 20 is mounted on the roll 12 with the pin heads between it and the roller, each unwanted piece of material 22 is pierced by one or more pins as the material to be stripped comes within the nip of the rollers 12, 13. The number of pins employed for each piece of unwanted material is dependent on the size of the piece.

The pins 21 are received in the wire brush covering 13' of the roll 13 as described in the above mentioned specification.

As the roll 12 rotates the pierced unwanted pieces are carried away from the wanted material by the pins 21. Subsequently the unwanted material must be removed from the pins and this is effected by a belt 23. This belt 23 is made of strong paper or other strong flexible material that can be penetrated by the pins 21, such as plastic, rubber, cloth or wire mesh, and extends over the width of the roll 12. Belt 23 is secured at its ends to two bars 24 carried between a pair of roller chains 25 passing over gear wheels 26 at the ends of roller 12 and an auxiliary roll 27. Roll 27 is also journalled in the frame 18 and has a slot 28 which, like slot 16 of roll 12, receives the bars 24 as the belt 23 passes round the rolls 12, 27.

The machine illustrated is intended to be fed with a cut blank on every second revolution of roller 12 and for this reason the belt 23 is shown as extending over only half the length of the chains 25, the arrangement being such that the belt passes over the roller 12 as shown during a stripping revolution. The chains have a length equal to twice the circumference of the roll 12, and the rolls 12, 27 have the same or different diameters, the gear wheels 26 having the same pitch diameters as the rolls on which they are mounted.

In operation, the belt 23 passes over the pattern sheet 20 on roll 12 and reaches the nip of the rolls 12, 13 slightly in advance of the leading edge of the blank to be stripped. It is therefore pierced by the pins 21 and lies beneath the blank and, in particular, the pierced pieces of unwanted material. When the belt leaves tangentially the sheet 20 at the point 30 it is removed from the pins 21 and as it lies between the pins and the unwanted material it automatically frees that unwanted material from the pins.

By virtue of the ratio of the length of the chains 25 to the circumference of the roller 12, the belt 23 is always penetrated by the pins 21 at the same point for the same pattern of pins. It is therefore capable of standing up to use for a long period of time and can be cheaply replaced when at last it becomes worn.

By providing belt 23 and by employing a pattern sheet 20 which is penetratable over its entire surface, there is no restriction on the positions on the pattern sheet at which the pins are inserted. It can therefore be ensured that, irrespective of the nature of the blank, a pattern sheet can be provided which will strip that blank with certainty. Furthermore, the removal of unwanted material from the pins is, unlike previous methods, guaranteed by the operation of the belt.

When the stripping machine strips a blank on every

revolution of the roller **12** the belt **23** extends continuously round the entire length of the chains **25**, alternative halves of the belt being used on successive revolutions of roller **12**.

In order that the wanted parts of the blank are prevented from following the surface of the roll **12** and therefore avoid the delivery means (not shown) located at the delivery side of the nip of rolls **12**, **13**, fingers **31** are carried at interevals on a shaft **32** within roller **12** and are adjustable along the shaft. The fingers **31** are L-shaped and the ends are secured to a second shaft **33** projecting through the end of the roller **12** and carrying a roller **34** travelling in a cam track **35** attached to the frame **18**. This cam track is so arranged that as the leading edges of the wanted material leaves the nip of the rolls **12**, **13**, the fingers are pivoted on shaft **32** with the result that they project through apertures in the roll **12** and holes **36** formed in the pattern sheet **20** and belt **23** and force the wanted material away from the roller **12**.

When a run on a particular type of blank is concluded, the pattern sheet **20** with the pins **21** held therein is removed from the roller **12** and stored for subsequent use. It is then replaced by another pattern sheet having pins **21** already located to suit the next blank to be stripped. At the same time it is preferable to place a new belt **23** in position.

I claim:

1. A stripping machine for stripping blanks comprising a first roller, outwardly directed pins detachably secured on the surface of said first roller in an irregular pattern selected to cause penetration of unwanted material in said blanks by said pins, a second roller co-operating with said first roller and having a surface in which said pins are receivable, a flexible sheet penetratable by said pins, and means detachably supporting and driving said sheet over a closed path which includes a part only of the circumference of said first roller including the nip of the co-operating rollers, at a peripheral speed substantially equal to the peripheral speed of said first roller, the length of said sheet being at least equal to that circumferential length of said first roller which carries said pins and the peripheral length of said closed path being exactly divisible by the distance travelled by one of said pins during a revolution of said first roller, whereby said sheet is penetrated by said pins at the same points in each revolution of said sheet over said closed path, unwanted material being removed from said blanks by the irregular pattern of pins, and the said sheet removing unwanted material pierced by the pins from said pins.

2. A stripping machine for stripping blanks according to claim 1 in which said sheet is made of strong paper penetratable at any point by the said pins.

3. A stripping machine according to claim 1 in which said second roller has a wire brush surface in which said pins are receivable.

4. A stripping machine according to claim 1 comprising also fingers mounted within said first roller and

means for causing said fingers to project through slots in the surface of said first roller at a predetermined point in each revolution of said first roller to urge said stripped blanks away from the surface of said first roller.

5. A stripping machine for stripping blanks comprising a first roller, outwardly directed pins detachably secured on the surface of said first roller in an irregular pattern selected to cause penetration of unwanted material in said blanks by said pins, a second roller co-operating with said first roller and having a wire brush surface in which said pins are receivable, a flexible, initially imperforate disposable sheet penetratable by said pins and endless bands, upon which said sheet is detachably mounted, supporting and driving said sheet over a closed path which includes a part only of the circumference of said first roller including the nip of the co-operating rollers, at a peripheral speed substantially equal to the circumferential speed of said first roller, the length of said sheet being at least equal to the circumferential length of that part of said first roller which carries said pins, and the peripheral length of said closed path being exactly divisible by the distance travelled by one of said pins during a revolution of said first roller, whereby said sheet is penetrated by said pins at the same points in each revolution of said sheet over said closed path, unwanted material being removed from said blanks by the irregular pattern of pins, and the said sheet removing unwanted material pierced by the said pins from said pins.

6. A stripping machine for stripping blanks comprising a first roller, outwardly directed pins detachably secured on the surface of said first roller in an irregular pattern selected to cause penetration of unwanted material in said blanks by said pins, a second roller co-operating with said first roller and having a surface in which said pins are receivable, a flexible sheet penetratable by said pins, and means detachably supporting and driving said sheet over a closed path which includes only a part of the circumference of said first roller including the nip of the co-operating rollers, at a peripheral speed substantially equal to the circumferential speed of said first roller, and the peripheral length of said closed path being twice the distance travelled by one of the said pins during a revolution of said first roller, whilst the length of said sheet is substantially equal to the distance travelled by one of the said pins during a revolution of said first roller, whereby said sheet is penetrated by said pins at the same points in each revolution of said sheet over said closed path, unwanted material being removed from said blanks by the irregular pattern of pins, and said sheet removing unwanted material pierced by said pins from said pins.

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