July 9, 1929. G. A. STEINER ET AL 1,720,495

COUNTING MACHINE

Filed June 1, 1925 2 Sheets-Sheet 1

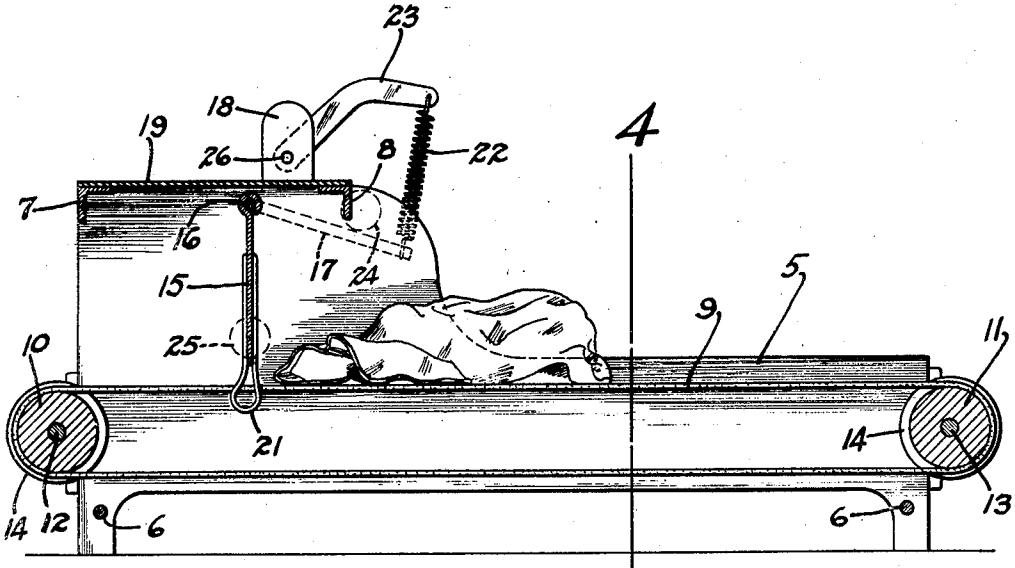


FIG. 1

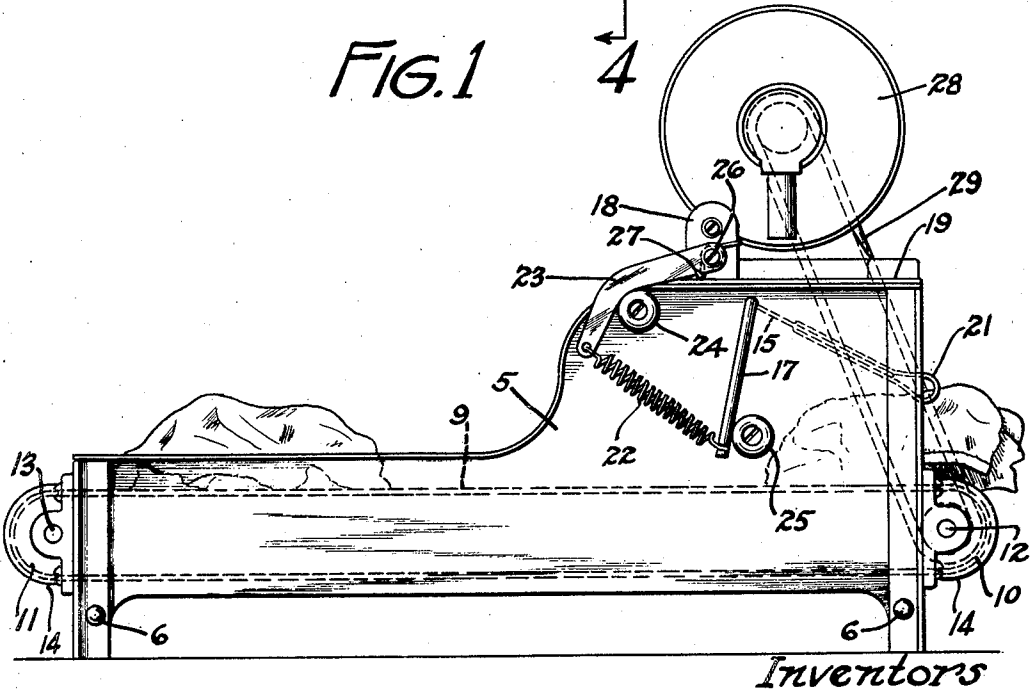


FIG. 2

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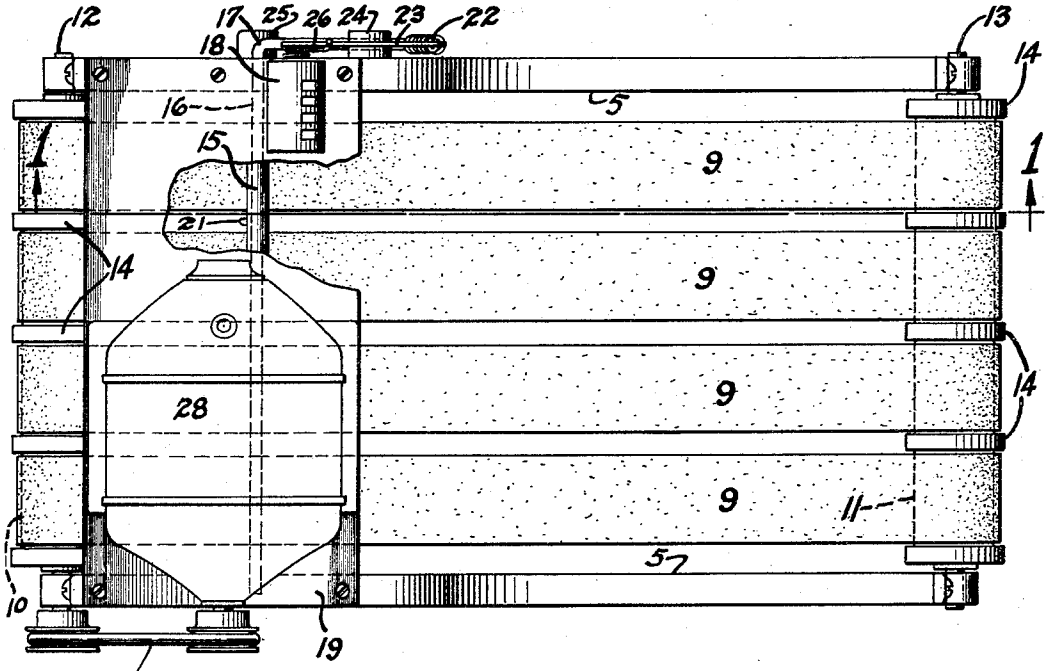


FIG. 3

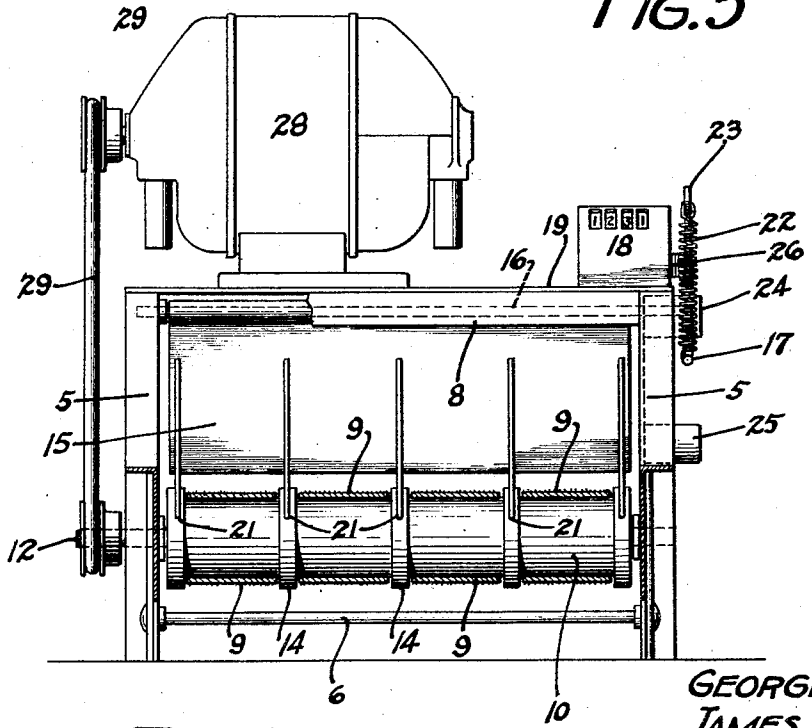


FIG. 4

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UNITED STATES PATENT OFFICE.

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COUNTING MACHINE.

Application filed June 1, 1925. Serial No. 34,029.

This invention relates to certain new and useful improvements in counting machines and more particularly relates to such machines adapted for use in laundries for counting pieces of soiled linen, returned to the laundries to be washed.

In most large cities there are usually concerns which specialize in supplying office and other buildings with clean towels or linen. These concerns usually contract with the tenants of such buildings to supply a certain number of towels per week or month, as the case may be, and at regular intervals deliver a certain number of clean towels and take back a like number of soiled towels. The soiled towels are returned to the laundry for washing, and the usual method employed by the laundries or linen supply companies for keeping a record of the number of towels sent out, is to count the soiled towels returned to the laundry. It is often difficult to accurately count the towels returned to the laundry, in that they are usually received in large baskets or are tied in bundles which must be untied and the pieces of linen or towels contained therein counted before they are thrown into the washing machines.

When thus counting baskets of linen running up into the hundreds of thousands of pieces, it is very easy to lose count in passing from one ten to the next ten, or from one hundred to the next hundred. This is especially true as interruptions often occur for the purpose of separating the linens; some of the linen may be of a kind that requires starching, some of it is colored, and for these and other reasons it is necessary to distribute the linen in various places.

It is, therefore, desirable that means be provided whereby each piece of linen may be accurately counted when returned to the laundry for washing, thereby eliminating losses occurring by mistakes in counting. Also by the provision of such means a great deal of time may be saved in the counting of such linen pieces.

An object of this invention, therefore, is to provide a simple and inexpensive machine particularly designed for use in counting pieces of fabricated material such as towels and other pieces of linen.

A more specific object of the invention is to provide such a machine comprising a conveyor composed of a plurality of spaced belts preferably having their upper surfaces sanded or suitably roughened to frictionally engage the pieces of linen to carry them through the machine; said machine also having a swinging gate mounted over the conveyor adapted to be engaged by each piece of linen as it passes through the machine, and said gate having means connecting it with a counter whereby, when it is operated, the counter will be actuated to register the number of towels having passed through the machine.

The particular object of the invention, therefore, is to provide an improved counting machine.

Other objects of the invention will appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

In the drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawings forming part of this specification,

Figure 1 is a vertical sectional view on the line 1—1 of Figure 3, showing the gate and associated parts in normal inoperative position;

Figure 2 is a side elevation of the machine showing a piece of linen passing under the gate, thereby causing the actuation of the counting mechanism;

Figure 3 is a plan view of Figure 1; and

Figure 4 is a cross sectional view on the line 4—4 of Figure 1.

The novel counting machine featured in this invention preferably comprises a frame having the opposed side walls 5, which may be suitably connected together by means of tie rods 6, and the angle bars 7 and 8 as shown in Figure 1; the side walls 5 are preferably cut away at the feeding end of the machine as shown, in order that the pieces of linen may be more readily thrown onto the conveyor of the machine.

An important feature of this invention resides in the novel construction of the conveyor upon which the pieces of soiled linen are thrown to be passed through the machine for actuating the counting mechanism. This conveyor, or shown in Figures 3 and

4, comprises a plurality of spaced belts 9 mounted upon suitable rolls 10 and 11 secured to shafts 12 and 13, respectively, which are rotatably mounted in suitable bearings secured to the frame of the machine. The conveyor rolls 10 and 11 are provided with spaced flanges 14, which function to retain the belts 9 in proper parallel spaced relation upon the rolls. The flanges 14 are comparatively narrow in width so that a corresponding gap is provided between the individual belts as shown in Figures 3 and 4. Each belt 9 preferably has its outer surface roughened or provided with a suitable material to frictionally engage the articles, or with cross bars or slats of suitable material, so that when a piece of linen is thrown on to the conveyor its engagement with the belts will rapidly feed the linen through the machine.

A gate 15 preferably of light weight material is pivotally mounted in the machine frame over the conveyor belts 9 in such a manner as to be engaged by the towels or pieces of linen passing through the machine. Such engagement of the gate by the pieces of linen in passing through the machine will cause the former to oscillate the shaft 16 upon which it is supported, which oscillation will actuate the arm 17 mounted on one side of the machine frame and having a yieldable connection with a counter 18 of ordinary construction, which preferably is mounted upon the upper wall 19 of the machine frame. A plurality of wire loops or depending lugs 21 are secured to the gate as shown in Figures 1 and 4. These loops or lugs depend into the gaps between the belts 9 and extend a suitable distance beneath the surface thereof, so that it will be impossible for a piece of linen or a towel to pass under the gate without swinging it sufficiently to cause the arm 17 to actuate the counting mechanism. This will readily be seen by referring to Figure 2 wherein it will be noted that the loops or lugs 21 of the gate are bearing against the towel and not the gate proper. The function of the lugs 21 is to increase the effective width of the gate so that each time a towel passes thereunder it will be oscillated sufficiently to actuate the counting mechanism.

Referring to Figures 1 and 2, it will be noted that the arm 17 secured to the rod or shaft 16 upon which the gate 15 is mounted is connected by means of a spring 22 to an operating arm 23 mounted upon the counter 18. A stop 24 is mounted on the adjacent side wall 5 of the machine frame to provide a limiting stop for the operating arm 23 of the counter in order to prevent it from being moved beyond a predetermined point. By thus flexibly connecting the oscillating arm 17 with the operating arm 23 of the counter, and also by means of the stop 24, which preferably is of rubber to provide a cushion for the arm, the swinging of the gate 15 will not be limited to the particular movement of the operating arm 23 of the counter, thereby providing means whereby the movement of the gate may vary in accordance with the size of the pieces of linen being fed through the machine. Such variation in the movement of the gate 15, however, will be insufficient to prevent the counting mechanism from registering the count. It is to be understood, of course, that the tension of the spring 22 is such that when the gate is in its normal position as shown in Figure 1, the operating arm 23 of the counter will be in the position shown in this figure, which will be the normal or starting position in the counter arm. When a towel is passed through the machine the gate 15 will be engaged thereby and will be moved to the position shown in dotted lines in Figure 2, such movement of the gate, however, always being sufficient to cause the arm 23 of the counter to be moved into contact with the stop 24, which is necessary in order to actuate the counting mechanism in the counter. A stop 25 may also be provided to limit the swinging movement of the gate (see Figure 2).

A torsion spring 26 is preferably mounted upon the shaft 27 of the operating arm 23 to exert an upward force against the arm so that when the gate is returned to its normal inoperative position shown in Figure 1 the spring 26 will simultaneously return the operating arm 23 to its normal inoperative position also shown in Figure 1. The tension or strength of the spring 22, however, is considerably greater than that of the torsion spring 26, so that when the gate is swung by the engagement of a towel therewith the arm 23 will be moved downwardly from the position shown in Figure 1 so that shown in Figure 2, after which the spring 22 will be elongated depending upon the movement of the gate.

The conveyor belts 9 are preferably operated by means of a motor 28 mounted upon the upper portion of the machine frame and having a belt drive 29 connecting it with the shaft 12 of the roll 10.

In the operation of this novel counting machine the pieces of soiled linen as they are returned to the laundry either in baskets or bundles, are thrown, one at a time, onto the conveyor belts 9, and are thereby fed through the machine each towel engaging the gate 15 and causing it to be actuated as hereinbefore described. Each such movement of the gate 15 will cause the operating arm 23 of the counter to be actuated, resulting in a count being registered in the counter as shown in Figure 4. By this novel machine, therefore, it will readily be seen that the operation of counting the pieces of linen

as they are returned to the laundry will be greatly facilitated, thereby reducing the amount of labor and time usually required to do this work with a resultant decrease in the cost of such work and also greatly increasing the accuracy of counting such pieces of linen or towels.

In the above description we have referred to the machine as being used to count pieces of soiled linen or towels, but it is to be understood that it may be used for counting various other kinds of material without departing from the scope of the invention.

We claim as our invention:

1. A machine for counting articles of varying areas and heights comprising a series of spaced feeding belts, fingers supported to swing freely between the belts, a counting mechanism, and connections between the counting mechanism and fingers to operate said mechanism each time the fingers are swung, by a belt-conveyed article, from between the belts to a position thereabove.

2. A machine for counting articles of varying areas and heights, comprising a frame, a series of comparatively narrow belts mounted thereon to move in closely spaced relation in the same direction, a gate suspended above said belts transversely thereof and having fingers depending and projecting between the belts, and operating to increase the effective length of the gate to prevent jamming of the articles under the gate, and counting mechanism connected with the gate and adapted to register whenever the fingers are raised sufficiently above the belts by the onward passage of an article.

3. A machine for counting fabric articles in crumpled or flat state and of varying areas comprising a series of spaced feeding belts, a counting mechanism, and means connected for operating the counting mechanism including fingers supported above the belts, and extended to swing freely between the belts, the arrangement being such that whenever the fingers are raised above the level of the upper run of the belts, and therefore from a position between the belts, the counting mechanism is properly operated, whereby jamming of any article is prevented, and whereby any article of minimum height will unfailingly give sufficient angular movement to the fingers to properly operate the counting mechanism.

4. A machine for counting articles of varying areas and height comprising a series of comparatively narrow belts arranged in closely spaced relation to have their upper runs in coplanar relation, means to move the belts in the same direction, a counting mechanism, a gate suspended above the belts and having its lower edge spaced above the belts, said gate having spaced fingers depending and projecting between the belts, and arranged in a row crosswise of direction of travel of the belts, and operating to increase the effective length of the gate and prevent jamming of articles therebeneath, and connections between the gate and counting mechanism arranged so that whenever the fingers are raised above the level of the upper run of the belts the counting mechanism is properly operated.

5. A machine for counting articles in a crumpled state of varying heights and areas comprising a belt made up of a plurality of narrow sections, held in narrow spaced parallel relation, means for moving the belts in the same direction, a counting mechanism, means connected to operate the counting mechanism including fingers swingingly mounted above the belts with one finger projecting downwardly between corresponding pairs of belts, said fingers adapted to be simultaneously swung upwardly to a position above the belts by an article lying loosely upon and conveyed by any section or sections of the belt.

In witness whereof, we have hereunto set our hands this 21st day of May, 1925.

GEORGE ADOLPH STEINER.
JAMES EVANS.