

Dec. 28, 1943.

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2,337,813

COUNTING APPARATUS

Filed Dec. 11, 1941

2 Sheets-Sheet 1

Fig. 2.

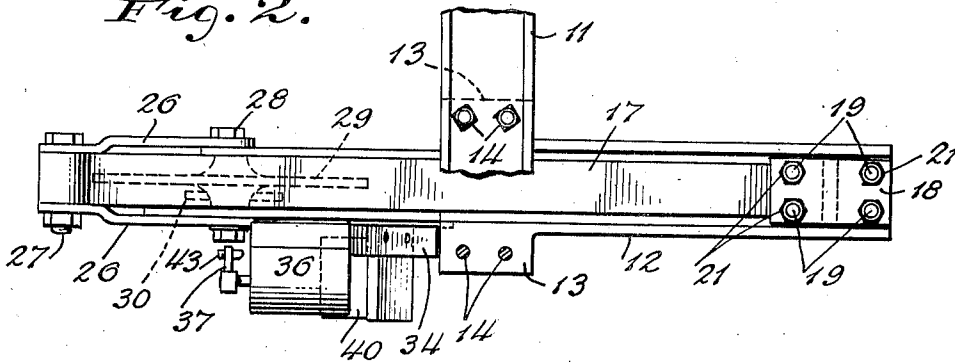
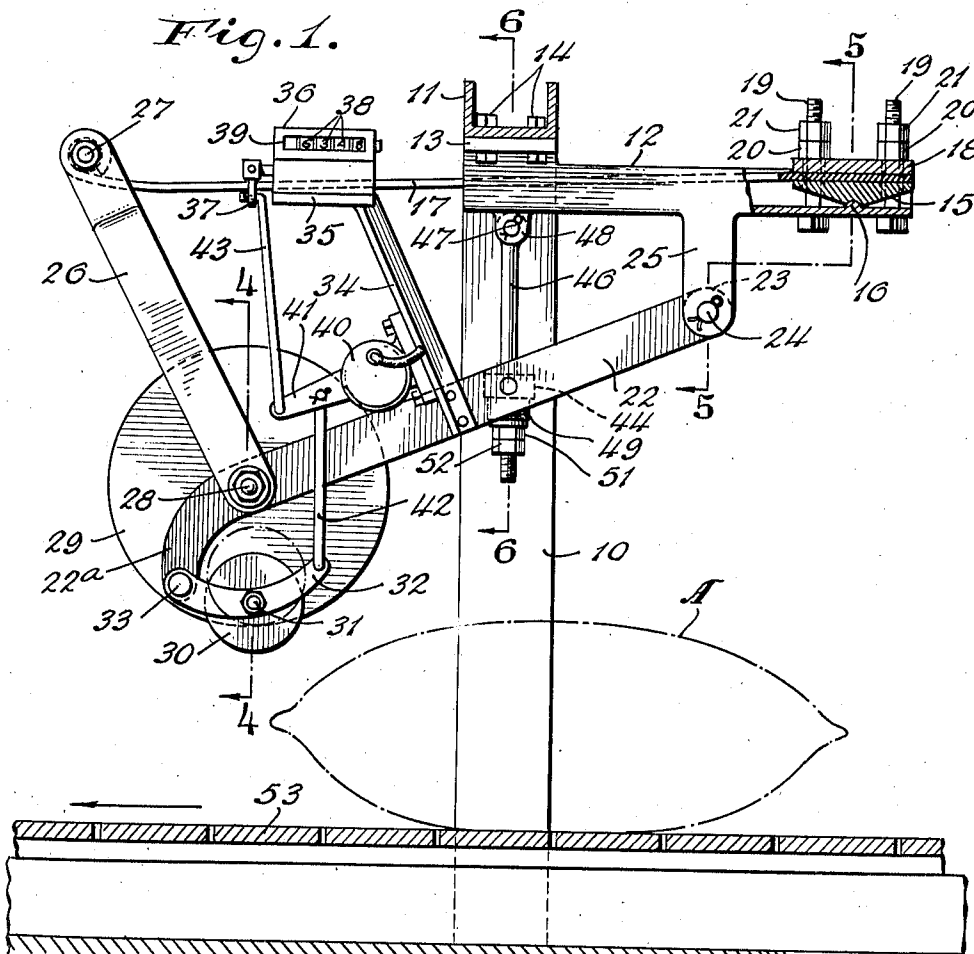


Fig. 1.



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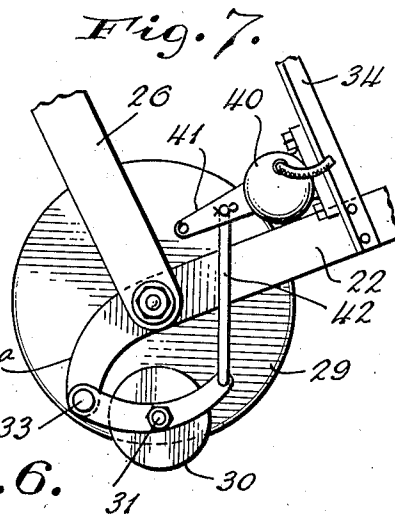
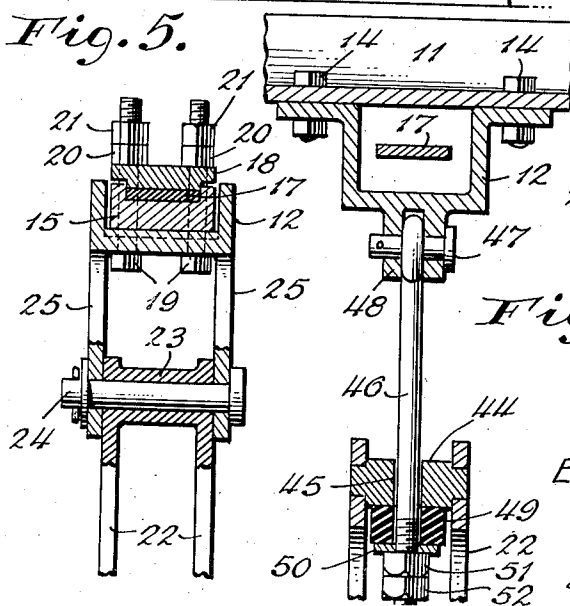
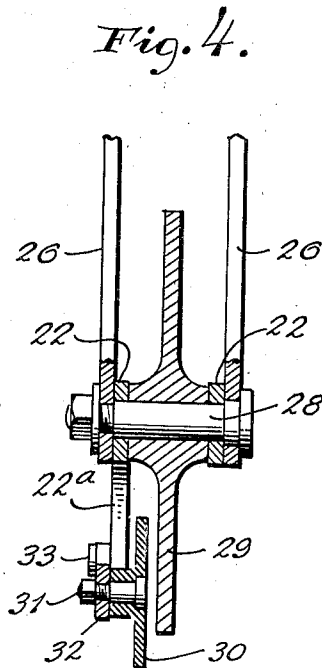
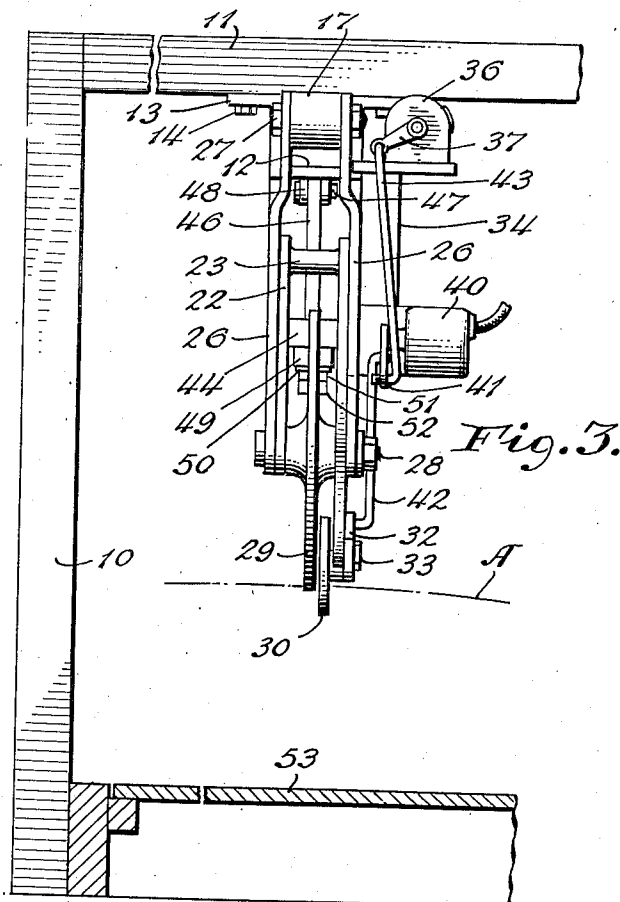
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COUNTING APPARATUS

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Application December 11, 1941, Serial No. 422,533

4 Claims. (Cl. 235—98)

The invention relates to counting apparatus and more particularly to apparatus for counting articles and has for its object to provide a simple apparatus of the indicated type for efficiently counting articles which are successively and progressively advanced in a predetermined manner and which travel in operative relation to the novel apparatus.

The invention contemplates further the provision of a novel counting apparatus designed particularly for counting articles of uneven or irregular contour as exemplified for instance by bags or sacks of merchandise.

Other objects will appear from the description hereinafter and the features of novelty will be pointed out in the claims.

In the accompanying drawings, which illustrate an example of the invention without defining its limits,

Fig. 1 is a side elevation of the novel apparatus;

Fig. 2 is a plan view thereof;

Fig. 3 is an end elevation of the novel apparatus;

Fig. 4 is a detail sectional view on the line 4—4 of Fig. 1;

Fig. 5 is a similar view on the line 5—5 of Fig. 1;

Fig. 6 is a corresponding view on the line 3—3 of Fig. 1, and

Fig. 7 is a fragmentary side elevation illustrating another arrangement of the novel apparatus.

In its illustrated form the apparatus comprises a supporting frame consisting of spaced upright members 10 (only one of which is shown) and a transverse member 11 extending between and carried by said upright members 10, said members 10 and 11 preferably being constructed of metal having a channel form in cross-section. A longitudinal channelled supporting bracket 12 is fixed upon the transverse member 11 of the supporting frame in any convenient manner as by means of oppositely projecting lugs 13 and bolts 14. A pivot block 15 is pivotally mounted in any convenient manner in the channel of said bracket 12 preferably adjacent to one end thereof; in the illustrated example the pivot block 15 is pivotally mounted to rock upon a pivot stud 16 which projects upwardly from the bottom of the channelled bracket 12 as shown in Fig. 1. The illustrated pivot block 15 is of substantially triangular form in cross-section and is provided with a flat upper face with which one end of a leaf spring 17 is in surface engagement. The

arrangement further includes adjusting means whereby the pivot block 15 is rocked upon the pivot stud 16 and secured in an adjusted position to vary the normal position of the leaf spring 17 for the purpose to be more fully pointed out hereinafter. In the example shown in the drawings, the aforesaid adjusting means serves also to secure the end of the leaf spring 17 in surface connection with the pivot block 15, and comprises a pivot plate 18 and bolts 19. The latter pass through the spring 17 and through suitable openings in the bottom of the bracket 12 and through openings in the pivot block 15 and pivot plate 18 and are screwthreaded at their upper ends for the accommodation of adjusting nuts 20 and lock nuts 21. The nuts 20 bear against the pivot plate 18 and in cooperation therewith clamp the end of the spring 17 in surface engagement with the pivot block 15 as illustrated in Fig. 1. These nuts 20 serve also to rock the pivot block 15 on its pivot stud 16 as will be more fully explained hereinafter.

The apparatus further includes a yieldable suspension frame consisting of carrying members 22 located in spaced parallel registry with each other and forming preferably integral parts of a bearing sleeve 23 pivotally mounted by means of a pivot pin 24 between lugs 25 which depend from the bracket 12 in spaced parallel registry with each other as shown in Fig. 5. The suspension frame further includes suspension members 26 located in spaced parallel registry with each other and each having one end pivotally connected at 27 with the outer free end of the leaf spring 17 which, as shown in Fig. 1, extends lengthwise of the channelled bracket 12 and outwardly beyond the same. The other ends of the suspension members 26 are pivotally connected by means of a bolt 28 or its equivalent with the carrying members 22. A tracer wheel 29 is rotatably mounted on the pivot pin 28 between the suspension members 26 as shown in Fig. 4.

A control wheel 30 of smaller diameter than the tracer wheel 29 is rotatably mounted by means of a pivot bolt 31 or its equivalent, upon an arm 32 which itself is pivotally connected at 33 with the preferably downwardly curved end 22a of the one carrying member 22 as shown in Figs. 1 and 7. A carrying bracket 34 is carried by the yieldable flexible suspension frame and in the illustrated example is fixed upon one of the carrying members 22, said bracket projecting upwardly from said carrying member 22 and terminating at its upper end in a horizontal support 35 upon which a counting device 36 of any con-

ventional type is secured; the illustrated counting device 36 includes an operating member 37 and the customary counting discs 33 visible through a slot 39. The carrying bracket 34 further carries an electric switch 40 which includes an operating member 41 and may be included in an electric circuit designed for instance to bring about the automatic discontinuance of the operation of an element or elements associated with the novel counting apparatus. As shown in Figs. 1 and 3, the arm 32 is connected by means of a link or operative connection 42 with the operating member 41 of the switch 40, and said operating member 41 in turn is connected by means of a link or operative connection 43 with the operating member 37 of the counting device 36. In some arrangements the switch 40 may include counting elements in which case the link 43 and the counting device 36 may be omitted, or said counting device 36 simply be disconnected from the operating member 41 as shown in Fig. 7. In other arrangements the arm 32 may be directly connected with the operating member 37 of the counting device 36 in which case the switch 40 may be omitted or simply remain disconnected from the arm 32 and the counting device 36.

In the operation of the novel apparatus the yieldable suspension frame and its associated elements may be raised by the articles being counted and in such case will drop back, between successive articles, by gravity assisted by the leaf spring 17, to the initial normal position shown in Fig. 1. For the purpose of cushioning this return movement of the parts, the apparatus includes a cushioning means which in its illustrated form consists of a bearing block 44 mounted at a suitable point between the carrying members 22 and provided with an aperture 45 which extends therethrough as shown in Fig. 6. A stop rod 46 extends slidably through the aperture 45 and is pivotally suspended by means of a pin 47, from lugs 43 which depend from the channelled supporting bracket 12 as illustrated in Fig. 6. An impact receiving cushion 49 preferably made of rubber or other resilient material, is mounted upon the stud rod 46 below and in engagement with a bearing block 44 as shown in Fig. 6. The cushion 49 rests upon a washer 50 mounted on the rod 46 and adjustably fixed in place thereon by means of a nut 51 and a lock nut 52.

In the illustrated example, the counting apparatus is of a form particularly designed to count articles of uneven or irregular contour as exemplified, for instance, by bags or sacks of merchandise A. The latter are progressively moved over a given path and pass in operative association with the counting apparatus, for instance, by means of a travelling conveyer 53 of any conventional type and operated in any convenient manner.

In practice the pivot block 15 may be rocked on the pivot stud 16 by loosening the nuts 20, 21 on one pair of associated bolts 19 and then screwing the nuts 20 and 21 of the other associated pair of bolts 19 downwardly thereon so as to develop pressure at one edge or the other of the pivot plate 13 and in turn the pivot block 15 to rock the latter on said pivot stud 16. Dependent upon the direction on which the pivot block 15 is thus rocked, the leaf spring 17 will be correspondingly adjusted to either raise or lower the outer end of said spring 17. This adjustment of the spring 17 will correspondingly raise or lower the suspension members 25 and pivotally swing the carrying members 22 to thereby raise or lower

the tracer wheel 29 and its associated control wheel 30 to a selective initial normal position. It will be noted that the carrying bracket 34 and the devices 36 and 40 mounted thereon together with the elements associated therewith will partake of the aforesaid movements of adjustment. In this way, the normal position of the tracing wheel 29 and its associated control wheel 30 may be selectively varied in accordance with the dimensions or other physical characteristics of the articles to be counted. In all of the normal positions of the tracer wheel 29 the associated control wheel 30 normally projects beyond the periphery thereof as illustrated in Fig. 1.

In describing the operation of the illustrated novel counting apparatus it will be assumed that it is being utilized for the purpose of counting sacks or bags of merchandise A which are being conveyed over a predetermined path by the conveyer 53 or its equivalent. It will be understood that this is not to be construed as defining the limits of usefulness of the novel counting apparatus and that the following description is intended to exemplify the operation of the apparatus in whatever field it may be utilized. As a sack or bag of merchandise A or other article passes in operative relation to the apparatus, the control wheel 30 will come into rolling engagement with the upper curved or other surface of the sack or bag A or other article being counted. At approximately the same time, or in proper operative timing, the tracer wheel 29 will likewise come into rolling engagement with said upper surface of the sack or bag of merchandise A or other article. As the advance of the bag or other article A continues relatively to the counting apparatus, the control wheel 30 will be shifted upwardly by the sack or bag of merchandise A, or other article, until the periphery of said control wheel 30 registers with the periphery of the tracer wheel 29, as shown by dotted lines in Fig. 1 and accordingly will swing the arm 32 upwardly on its pivot 33. This pivotal movement of the arm 32 will exert an upward pushing force on the link 42 and will swing the operating member 41 upwardly to thereby cause the switch 42 to operate and perform its functions and at the same time will cause the operating member 41 to transmit an upward push to the link 43 whereby the operating member 37 will be actuated to operate the counting discs 33 of the counting device 36 in the well-known way. As the advance of the sack or bag of merchandise A or equivalent article continues, the tracer wheel 29 and the control wheel 30 will roll along the upper surface of said sack or bag of merchandise A and the control wheel 30 will finally return to its normal position illustrated in Fig. 1 ready for contact with and operation by the next succeeding sack or bag of merchandise A or equivalent article as the same is carried along by the conveyer 53 or its equivalent. The tracer wheel 29 will correspondingly roll along the upper surface of said sack or bag of merchandise A or other article and if the dimensions of the latter require it, will yield upwardly against the tension of the leaf spring 17; in other words, the yieldable suspension frame on which the tracer wheel 29 and its associated elements are mounted will be pivotally actuated relatively to the lugs 25 against the tension of the leaf spring 17 to permit this upward yielding of the tracer wheel 29 if this should be necessary. The carrying bracket 34 and the switch 40 and counting device 36 partake of these

yielding movements of the aforesaid suspension frame.

As the travel of the sack or bag of merchandise A or equivalent article continues, the tracer wheel 29 will continue its rolling travel along the upper surface of said sack or bag of merchandise A, or other article, and the suspension frame with the elements carried thereby finally will return to the initial normal position occupied thereby, this return movement being effected by gravity assisted by the tension of the leaf spring 17. If the surface contour of the article being counted is such that the control wheel 30 and tracer wheel 29 abruptly drop therefrom when said article has been advanced beyond the same, the aforesaid return movement of the parts will be yieldingly arrested by the cushion 49 coming into engagement with the bearing block 44. In such event the developed impact will be neutralized without strain upon the elements of the apparatus, and in any case the return movement of the suspension frame will be arrested to restore all of the elements of the apparatus to their initial normal position without injury or strain. As the next successive sack or bag of merchandise A or other article is advanced by the conveyer 53 or its equivalent, and passes in operative relation to the counting apparatus as previously described, the parts again will be operated by said successive article in the manner set forth to record the same on the counting device 36.

Because of the fact that operated elements of the apparatus including the counting devices are all mounted upon a common support, as exemplified by the yieldable suspension frame, the operative relation between said elements remains undisturbed at all times and under all conditions.

The apparatus is extremely simple in construction and operates with maximum efficiency and may be utilized in many fields of activity for counting articles whenever and wherever such a result is desired. The apparatus is particularly adapted for efficiently counting articles of uneven or irregular contour as exemplified for instance by the bags or sacks of merchandise A.

The apparatus furthermore is not restricted to counting successive articles of corresponding type and may be used, with equal efficiency, for counting successive articles which differ from each other in physical character or form.

Various changes in the specific forms shown and described may be made within the scope

of the claims without departing from the spirit of the invention.

I claim:

1. A counting apparatus comprising a supporting frame, a longitudinally channeled supporting bracket fixed upon said frame, a pivot block pivotally mounted in the channel of said bracket, a leaf spring having its one end secured to said pivot block and extending therefrom lengthwise of the channel of said bracket and outwardly beyond the same, a yieldable suspension frame pivotally connected with said supporting bracket and with the free end of said leaf spring, counting means carried by said yieldable suspension frame, and means on said suspension frame adapted to be acted on by said articles to operate said counting means, and means for pivotally rocking said pivot block and setting same in varying positions whereby the leaf spring is shifted to adjust said operating means to different normal positions.

2. A counting apparatus comprising a frame, a rocking pivot block mounted on said frame, an elastic member carried by said pivot block, a yieldable frame connected and movable with said elastic member, counting mechanism carried by said yieldable frame, and means for rocking said pivot block to adjust said elastic member and thereby vary the normal position of said yieldable frame and the counting mechanism carried thereby.

3. A counting apparatus comprising a frame, an elastic member adjustably mounted on said frame, counting mechanism carried by and movable with said elastic member, and means for adjusting said elastic member to thereby vary the normal position of said counting mechanism.

4. A counting apparatus comprising a supporting frame, supporting means carried by said frame and comprising a rigid section and an elastic section, a yieldable suspension frame pivotally connected with both of said sections, a tracer wheel rotatably mounted on said suspension frame for contact with the articles to be counted, a counting device supported on said suspension frame, an arm pivotally mounted on said suspension frame and operatively connected with said counting device, and a control wheel journaled on said arm and normally projecting beyond the periphery of said tracer wheel for contact with and shifting by the articles to be counted to pivotally actuate said arm and thereby operate said counting device.

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