May 13, 1941. B. I. BUCK 2,241,978

CONVEYER MECHANISM

Original Filed Dec. 12, 1938 2 Sheets-Sheet 1

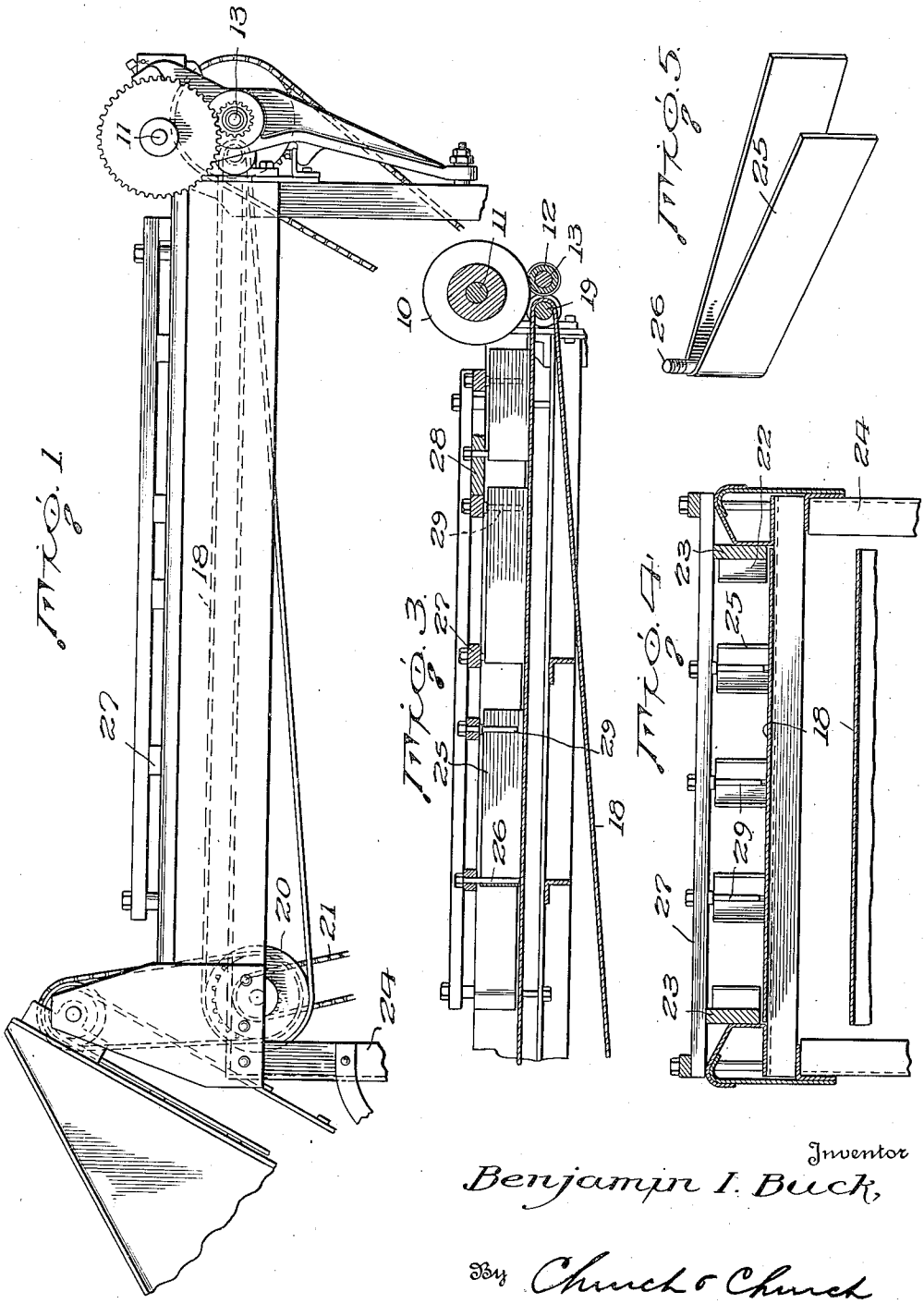


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Inventor
Benjamin I. Buck,

By Chuck & Chuck
His Attorneys

May 13, 1941. B. I. BUCK 2,241,978

CONVEYER MECHANISM

Original Filed Dec. 12, 1938 2 Sheets-Sheet 2

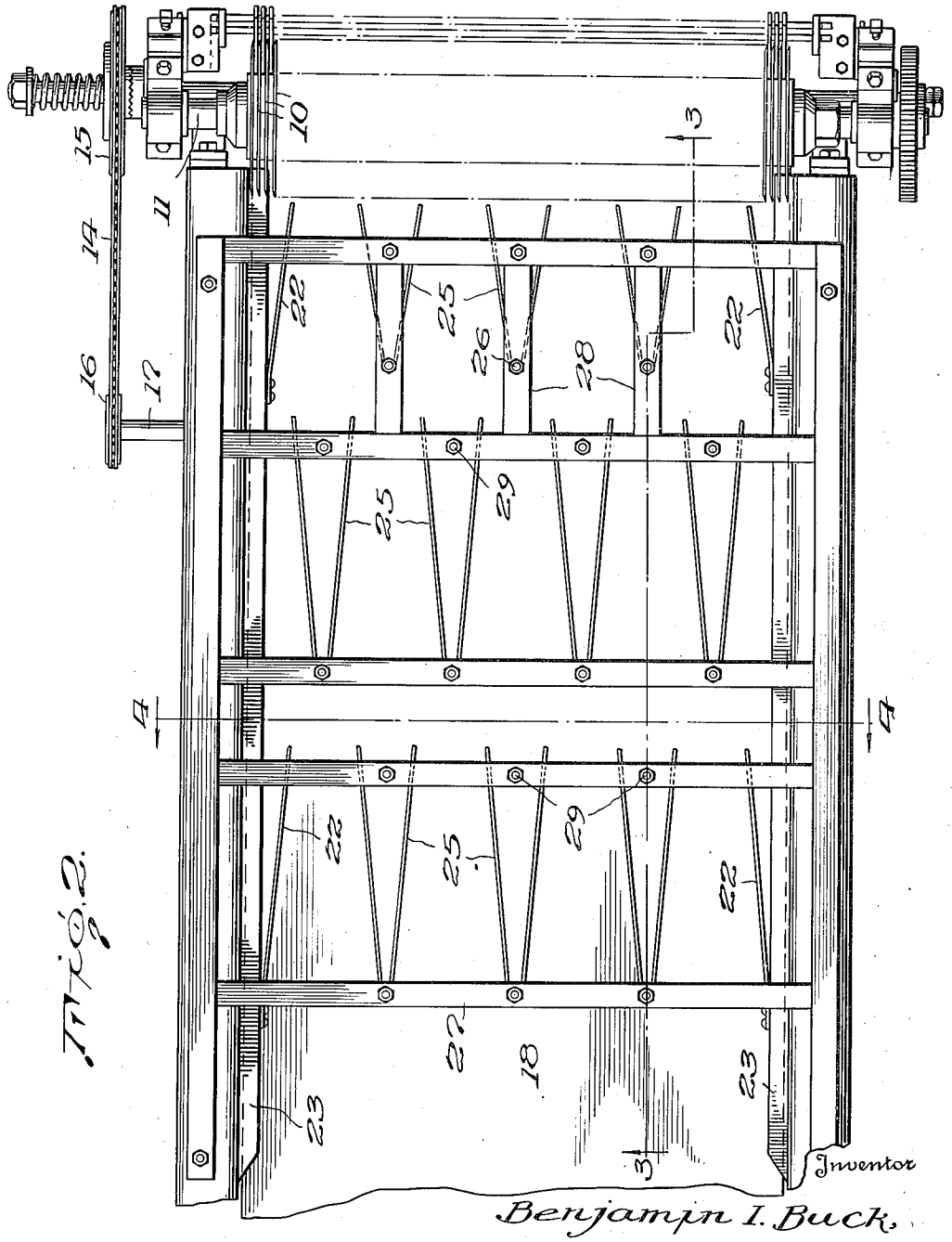


Fig. 2.

Inventor
Benjamin I. Buck,
By Church & Church
His Attorneys

Patented May 13, 1941 2,241,978

UNITED STATES PATENT OFFICE

2,241,978

CONVEYER MECHANISM

Benjamin Irven Buck, Baltimore, Md.

Original application December 12, 1938, Serial No. 245,287, now Patent No. 2,221,699, dated November 12, 1940. Divided and this application December 20, 1939, Serial No. 310,258

7 Claims. (Cl. 198—30)

This invention relates to improvements in conveyer apparatus wherein articles on a conveyer surface are adapted to be arranged lengthwise on said surface while being conveyed from one point to another.

The invention is especially designed for use in slicing machines in which vegetables, for instance, string beans or snap beans are to be fed endwise into the slicing mechanism so that they will be sliced lengthwise. The primary object of the invention, therefore, is to provide a simple arrangement for arranging the beans, while on the conveyer, lengthwise of the direction of travel of the conveyer.

A still further object of the invention is to provide a simple means for arranging the beans lengthwise of the conveyer which will not interfere with the movement of the beans toward the slicing mechanism. With the present bean-arranging instrumentalities, there is no tendency for the beans to clog or jam on the conveyer and, where groups of beans are moving along the conveyer, such groups will be disintegrated, and the individual beans arranged lengthwise of the conveyer.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described, and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawings—

Figure 1 is a fragmentary side elevation of a bean-slicing machine illustrating the slicing mechanism and the conveyer for delivering the beans to such slicing mechanism;

Fig. 2 is a top plan view of the slicing mechanism and a portion of the conveyer;

Fig. 3 is a vertical sectional view taken longitudinally of the conveyer belt on the line 3—3 of Fig. 2;

Fig. 4 is a transverse vertical sectional view of the conveyer on the line 4—4 of Fig. 2; and

Fig. 5 is a detail perspective view of one of the members provided for arranging the beans lengthwise of the conveyer or endwise with respect to the slicing mechanism.

As stated, the invention has been designed especially for use in a bean-slicing machine such as illustrated in the drawings, wherein the slicing instrumentalities consist of a series of circular cutting knives or discs 10 mounted on a shaft 11 and a plurality of circular supporting members 12 mounted on a shaft 13. The mounting and operation of these cutting instrumentalities is fully disclosed and claimed in applicant's co-pending application Serial No. 245,287. Suffice it, here, to say that the shafts carrying the discs and supporting members are rotated by a sprocket chain 14 on a pulley 15 on one of said shafts, and a pulley 16 on a shaft 17 adapted to be driven from a prime mover (not shown). The conveyer 18 for feeding the beans to the slicing mechanism is in the form of an endless belt traveling around rollers 19, 20, and motion is imparted to the belt by driving connections comprising a sprocket chain 21 driven from the prime mover.

As the beans are to be sliced lengthwise, they must be fed endwise to the slicing knives or discs and, for this purpose, a plurality of what might be termed straightening or arranging members are provided above the upper or bean-supporting surface of the conveyer in such a fashion as to preclude clogging of clumps or groups of beans between such members. Specifically, these arranging or straightening means comprise a plurality of V-shaped strips of metal arranged in rows transversely of the upper surface of the belt on which they rest edgewise, with their apices arranged to engage beans advanced toward the slicing mechanism by the belt. The positioning members 22 at the sides of the belt are fastened to the side walls 23 between which the belt 18 travels. These side walls 23 are mounted on the frame 24 and, in conjunction with the belt 18, constitute substantially a trough along which the beans are conveyed by the belt from the point at which the beans are deposited on the belt to the slicing mechanism. The intermediate arranging members 25 are held in place lengthwise of the belt by pins 26 that extend downwardly through cross-members 27 positioned above the belt. If desired, the cross-members 27 may be connected by longitudinal strips 28 in which certain of the pins 26 may be secured. It will be observed that the arranging members 25 of each row are staggered with respect to the members of the next succeeding row so that, should a clump or group of beans pass between any two members of one row, it will engage against the forward end of a member in the next row and, due to the continued movement of the belt, be gradually disintegrated. The individual beans of such a group or clump gradually swing around the forward end of the member as a pivotal center until they automatically arrange themselves lengthwise of the belt. Similarly, should a single bean be disposed transversely of the belt as it approaches the arranging members, it will engage against the forward end of one of said members and, due to the continued movement of the belt, swing or pivot around the forward end of the member until it assumes a position lengthwise of the belt.

Preferably, these arranging members possess a certain degree of resiliency, particularly the members 22 which are fast at the sides of the belt. However, the intermediate members 25 may merely loosely encircle the pins 26 so that they are free to oscillate transversely of the belt. Thus, there is less likelihood of the beans jamming or

clogging between two adjacent members of a row. It will be apparent that, as a group or clump of beans enters the space between two of the arranging members, the latter are capable of swinging away from each other, thus widening the passage between them to facilitate continued movement of the beans. If desired, means may be provided for limiting this oscillatory motion of the members 25. For instance, where V-shaped members are used, as shown, additional pins 29 may be provided in certain of the cross-members 27, such pins being located between the free ends of the members 25 so as to engage one or the other side of the member depending upon the direction in which the latter is oscillated. This particular form of arranging member is furthermore advantageous in that the members may be readily removed for replacement or other purposes.

It will be understood that the so-called arranging members do not function to direct the individual beans in a particular path, but merely function to cause the beans to become disposed lengthwise of the belt. For this reason the sides of members 25 should have plane surfaces as any projections or protuberances on those surfaces of said members would only tend to deflect the beans transversely of the belt. The surface of the belt is unobstructed intermediate each two members of a row so that, as previously pointed out, should a bean, disposed transversely of the belt, come into contact with the apex of a member, the tendency of the member to arrest the movement of the bean, in conjunction with the tendency of the belt to continue to advance one end or the other of the bean, will cause the bean to pivot on the apex of the member against which it is engaged so that it swings around, so to speak, on the belt and arranges itself lengthwise of the belt surface. As the beans are deposited on the receiving end of the belt in a promiscuous fashion, they oftentimes are advanced to the arranging members in clumps or groups, and the pivotal motion of the individual arranging members is for the purpose of permitting such clumps or groups to pass between them, it being understood that, when such a clump of beans passes between two members of one row, it engages the apex of a member of the succeeding row, due to the staggered relationship of the members of adjacent rows. As previously pointed out, a group of beans engaging against one of the members is temporarily arrested but, due to the continuously moving belt, the individual beans of the group are gradually carried on and arranged lengthwise of the belt by one or more of the arranging members.

It will also be appreciated that the use of the invention is not necessarily limited to bean-slicing machines, but that a machine of this type has merely been used in the present instance for purposes of illustration.

The present application constitutes a division of applicant's copending application, Serial No. 245,287, filed December 12, 1938, above referred to, now Patent 2,221,699, issued Nov. 12, 1940.

What I claim is:

1. In a conveyer mechanism, an endless traveling conveyer on which articles are adapted to be deposited, means for arranging said articles lengthwise of the conveyer, said means comprising elongated article-engaging elements arranged in spaced relation transversely of the conveyer with each element disposed substantially longitudinally of the conveyer and with an unobstructed passage for the articles between each two elements, said elements having plane surfaces engageable by said articles and said elements being free to oscillate transversely of the conveyer to enlarge the passage between them.

2. In a conveyer mechanism, an endless traveling conveyer on which articles are adapted to be deposited, means for arranging the articles lengthwise of the conveyer, said means comprising elongated article-engaging elements arranged in spaced relation transversely of the conveyer with each element disposed substantially longitudinally of the conveyer and with an unobstructed passage between adjacent elements, said elements having plane surfaces engageable by said articles and said elements being free to oscillate transversely of the conveyer to increase the width of said passage, and means for limiting the oscillatory movement of said elements.

3. In a conveyer mechanism having an endless traveling conveyer surface, means for arranging articles lengthwise of said surface, said means consisting of V-shaped finger-like elements pivoted at their apices to swing laterally of said surface, said elements being spaced apart laterally of said surface with an unobstructed passage between each two juxtaposed elements.

4. In a conveyer mechanism having an endless traveling surface, means for arranging articles longitudinally of said surface, said means comprising rows of laterally spaced article-engaging elements extending substantially longitudinally of said surface, said members being pivoted to oscillate transversely of the surface with an unobstructed passage intermediate each two juxtaposed elements, and the elements of one row being staggered with respect to the members of the next adjacent row.

5. In a conveyer mechanism having an endless traveling surface, means for arranging articles on said surface lengthwise of the direction of movement of the surface, said means consisting of V-shaped members pivoted at their apices and arranged in rows extending transversely of the surface with an unobstructed passage between each two members of a row, said members being pivoted to oscillate laterally of said surface whereby the passage between two members of a row may be widened, and the members of one row being staggered with respect to those of the next adjacent row.

6. In a conveyer mechanism having an endless traveling conveyer, means for arranging articles lengthwise of said conveyer, said means comprising cross-members spaced above the conveyer, pins depending from said cross-members, and V-shaped members loosely engaging said pins with the pins positioned in the apices of said V-shaped members whereby the latter are free to oscillate about said pins relatively to the conveyer.

7. In a conveyer mechanism having an endless traveling conveyer, means for arranging articles lengthwise of said conveyer, said means comprising cross-members spaced above the conveyer, pins depending from said cross-members, V-shaped members loosely engaging said pins with the pins positioned in the apices of the members whereby the latter are free to oscillate relatively to the conveyer, and a second set of pins carried by said cross-members and located between the free ends of said members to limit the oscillatory movement of the latter.

BENJAMIN IRVEN BUCK.