Feb. 13, 1968 J. S. EASTHAM 3,368,658

HARDWOOD CARTON BRAKE

Filed July 20, 1966 2 Sheets-Sheet 1

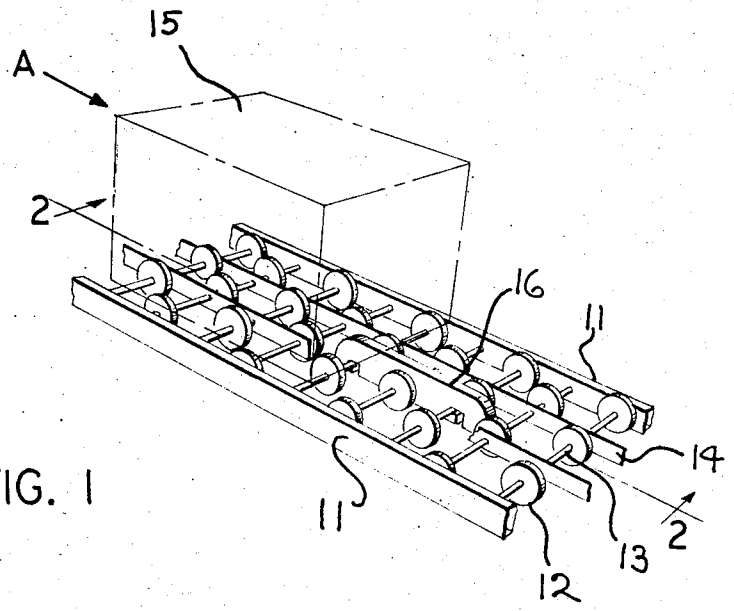


FIG. 1

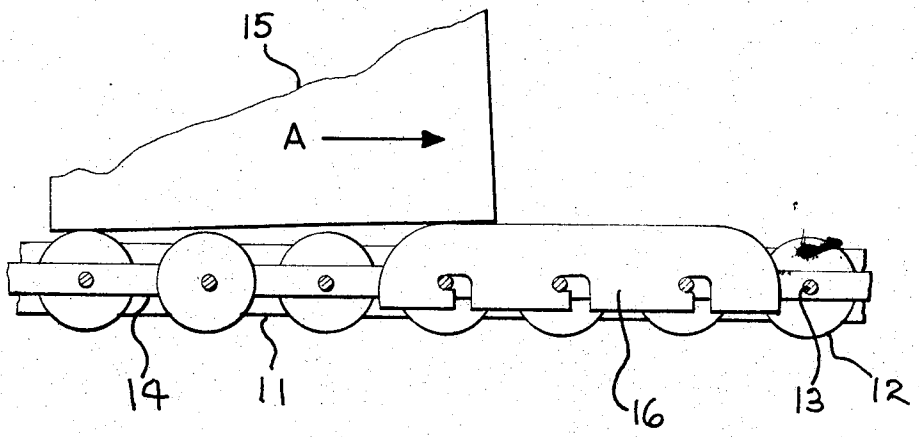


FIG. 2

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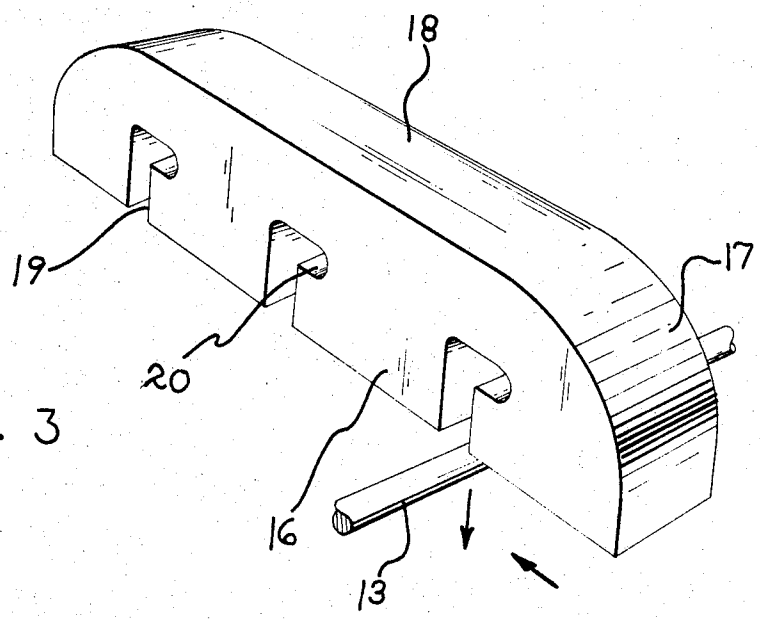


FIG. 3

FIG. 4

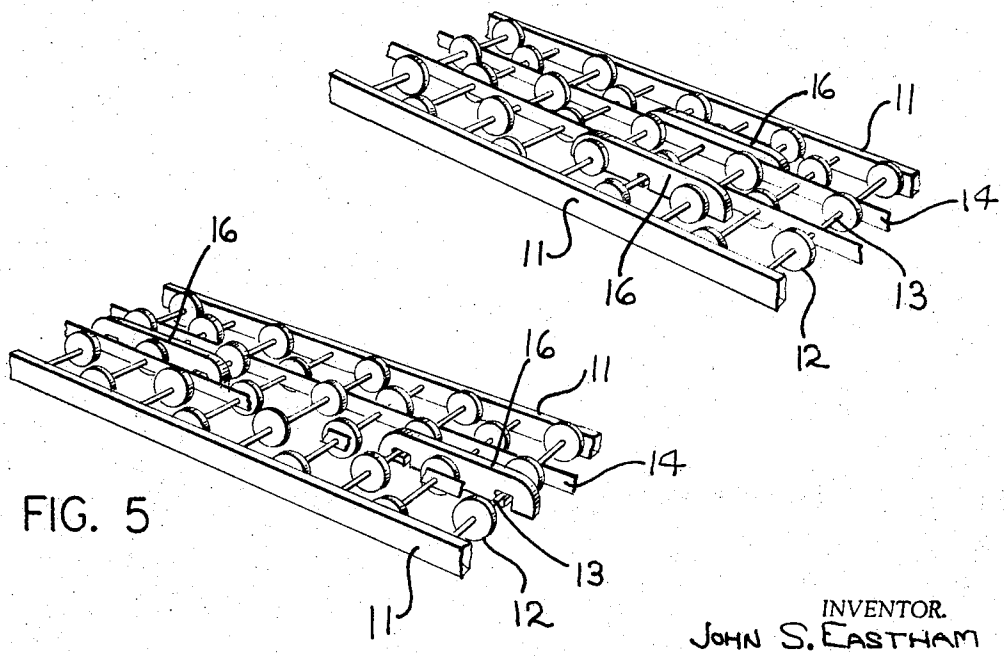


FIG. 5

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HARDWOOD CARTON BRAKE

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5 Claims. (Cl. 193—35)

ABSTRACT OF THE DISCLOSURE

An inexpensive brake for controlling carton speeds on roller skate wheel conveyors, the brake comprising a block having a carton engaging surface disposed upwardly of the conveyor wheels and including means engageable with the conveyor axles for releasably mounting the brake on the conveyor in a carton engaging, stationary position.

This invention relates to gravity wheel conveyors and more particularly to a braking mechanism for roller skate wheel conveyors of the gravity type.

Utilization of either roller or wheel type gravity conveyors, for transporting boxes and other loaded objects, hereinafter termed "cartons," has long been known in the materials handling art. These conveyors, consisting essentially of an anti-friction trackage, dictate a predetermined path upon which cartons are transferred. The actual carton transferral is accomplished by placing the trackage in non-parallel alignment to the horizontal, thereby enabling gravity to become the operative force on the cartons and cause their displacement along the conveyor.

It is well appreciated, by those in the gravity conveyor art, that for any angle of inclination between the plane of the conveyor and the horizontal, a carton with a large mass will traverse more rapidly along the trackage than will one of lesser mass. In typical conveyor installations, the minimum angle of inclination necessary to insure and provide for a longitudinal displacement of the relatively light cartons, is sufficient in magnitude to cause larger mass cartons to traverse at such rates as to create practical difficulties in operating the conveyor mechanism. The most frequent problem encountered is the collision of high speed cartons with those accumulated at the terminal point of the conveyor. These collisions result in the potential breakage of any fragile components packed within the cartons. Additionally, as a result of centrifugal action, cartons possessing too high a velocity tend to become dislodged at the curved sections of the conveyor, and again create the breakage problem with internally packed components. The potential breakage problem resulting from the above noted conditions, can be eliminated by supplying a mechanism to retard the excessive carton velocities. It should be noted that, the problem can not be remedied by adjusting the angle of inclination so as to impart a minimum velocity to larger mass articles, as this angle will generally be found to be insufficient to impart motion to the lighter cartons.

Certain factories and production facilities are burdened with thet problem of inadequate floor space. Because of this space problem and the consequent need to achieve the desired elevation drop within the space available, conveyors may have to be installed on such a steep incline that the speeds attained without braking are also impractical. This invention furnishes an inexpensive, simple means for controlling the carton speeds in these factories.

Numerous brakes, or mechanism for retarding the motion in a relatively high velocity carton have been disclosed in the arts and generally function well in their intended purposes. These disclosed braking mechanisms function indirectly in retarding the velocity of the traversing carton, that is, they operate directly upon the rollers of the gravity conveyor and not upon the carton. Furthermore, the braking shoe or member is generally brought into operative frictional engagement with the rollers by mechanisms which will be found to be relatively complex when contrasted with that employed in the present invention. Because of this relative complexity of mechanism, the installation of these prior disclosed brakes are prone to mechanical failures.

Accordingly, it is the general object of this invention to provide a novel brake to impede the motion of cartons traversing a wheel conveyor of the gravity type, wherein the braking member, which is slotted to receive adjacent axles of the conveyor wheel and provide a self-locking feature therewith, extends beyond the plane defined by the uppermost portions of the anti-friction wheels of said conveyor and has its longitudinal extremities suitably sloped to provide for smooth ingress and egress of the carton.

It is another object of the invention to provide a braking mechanism for utilization with a gravity wheel conveyor which comprises a minimum number of components, is inexpensive in construction, and is easily removed from the conveyor.

It is still a further object of this invention to provide a braking mechanism for a gravity wheel conveyor which is simple in construction and operation, and possesses virtually no possibilities of mechanical failures.

A more comprehensive understanding of the subject invention may be obtained from the following description in conjunction with reference to the appended drawings:

FIG. 1 is a perspective of a wheel conveyor of the gravity type showing an embodiment of the present invention;

FIG. 2 is a schematic side elevation taken on a plane 2—2 through the brake as shown in FIG. 1;

FIG. 3 is an isometric view of a preferred embodiment of the braking member, and illustrates the simplicity of installing said member into the conveyor axle.

FIG. 4 is a perspective drawing showing an embodiment of the invention in which a plurality of braking members are utilized.

FIG. 5 shows an alternate arrangement for the utilization of multiple braking members.

In FIGURE 1, a carton **15** is shown traversing in the direction denoted by arrow A, upon a conveyor comprised of spaced side rails **11** to which are suitably attached a plurality of axles **13**, said axles being additionally supported by horizontally disposed longitudinal braces **14**, and having rotatably mounted thereto, at spaced intervals, a plurality of anti-friction wheels **12**.

Braking member **16**, which is preferably of hardwood construction, is formed with angled transverse slots **19** and is generally defined by a substantially top planar surface **18** whose longitudinal extremities **17** are sloped downwardly. The angled transverse slots **19** are so designed as to receive and engage adjacent wheel axles, and contain a generally longitudinally disposed recess **20** into which the axles **13** can be translated. Furthermore, the brake member **16** is so dimensioned that, upon installation unto the conveyor axles **13**, its upper, substantially planar surface **18**, extends slightly above the plane defined by the uppermost portions of the plurality of roller wheels. Additionally, the transverse dimension of the brake must be chosen so as to enable the brake to be interposed between transversely adjacent anti-friction wheels.

The operation of the braking system is as follows: Any carton, traversing the gravity wheel conveyor, along the plane defined by the plurality of anti-friction wheels, will encounter the curved extremities of the hardwood brake; the carton will consequently be raised onto the

braking surface whereby, as a result of the frictional contact between the lower planar surface of the carton and the lineal extent of the upper hardwood brake surface, the translational velocity will be decreased. Because the retardation of the carton velocity is accomplished by frictional contact between the carton and the brake member, various and alternate arrangements for the utilization of this invention are possible. These alternate arrangements are easily and rapidly accomplished because of the inherent ease of removing and installing the simple brake member unto the conveyor. FIGURES 4 and 5 respectively, show a parallel and series arrangement of a plurality of braking members. The parallel relationship of multiple brake members allows the conveyor system to be used for transporting cartons of various sizes by insuring carton-brake contact. Because the braking effect is also greater with multiple members, the parallel arrangement can be used to decrease the distance within which braking is accomplished. Arranging the members in series relation can also be used to vary the braking effect, and thereby, for example when cartons of a fixed size are used, allow the transporting of various weight cartons without the danger of excessive speeds. The effects of these alternate arrangements, which make the conveyor itself more flexible and versatile in its operation, can also be accomplished by changing the longitudinal and transverse dimensions of the brake itself.

Upon initial carton-brake contact, because of the transfer of momentum from the carton to the brake, there is a tendency for said brake to be displaced along the axis of the conveyor and in the direction of carton motion. This invention also provides a self-locking feature whereby this brake displacement is arrested. The ease with which the brake is installed and removed from the conveyor, as well as the operation of the self-locking mechanism, is best illustrated by reference to FIGURE 3. To intall the member, the transverse slots of the brake are placed in vertical registry with their intended supporting axles and the brake is subsequently displaced vertically unto said recipient axles. The self locking feature is engaged by displacing the brake relative to the axles, in the direction of the carton travel, thereby causing the axle to become locked in the longitudinally extended recess portions of the slots. Since the longitudinal recesses are oriented in a convex relation to the approaching cartons, any translation of the brake, resulting from carton contact, will insure the axles being locked at the terminal portion of the recess and thereby maintain the braking mechanism in its desired position.

I claim:

1. In combination with a gravity conveyor of the wheel type, having spaced side rails, to which are attached at definite intervals a plurality of axles, said axles having rotatably mounted thereto a plurality of anti-friction wheels, a single component braking mechanism of hardwood construction, interposed among transversely adjacent wheels and extending along the conveyor axis parallel to the side rails, the brake being characterized by transverse slots, adapted to receive any adjacent wheel

axles and a substantially planar surface which extends above the plane defined by the uppermost portions of the plurality of anti-friction wheels, said planar surface having downwardly curved longitudinal extremities.

2. In combination with a gravity conveyor of the wheel type, having spaced side rails, to which are attached at definite intervals a plurality of axles, said axles having rotatably mounted thereto a plurality of anti-friction wheels, a single component braking mechanism of hardwood construction interposed among transversely adjacent wheels and extending along the conveyor axis parallel to the side rails, the brake being characterized by angled transverse slots, having a generally longitudinally disposed recess adapted to removably receive adjacent wheel axles and providing an interlocking relation therebetween, and a substantially planar surface which extends above the plane defined by the uppermost portions of the plurality of anti-friction wheels, said planar surface having downwardly curved longitudinal extremities.

3. In combination with a gravity conveyor of the wheel type, having spaced side rails, to which are attached at definite intervals a plurality of axles, said axles having rotatably mounted thereto a plurality of anti-friction wheels, a braking member, interposed among transversely adjacent anti-friction wheels and extending along the conveyor axis parallel to the conveyor side rails, said braking member comprising a block having spaced-apart transverse slots on its lower surface adapted to engageably receive adjacent wheel axles and including a raised frictional surface extending above the plane defined by the uppermost portions of the plurality of anti-friction wheels, the longitudinal extremities of said raised frictional surface being suitably shaped so as to provide smooth ingress and egress of a carton unto the brake surface.

4. A conveyor defining an inclined path for transferring and supporting cartons, comprising a skate wheel conveyor segment having transverse axles rotatably mounting the skate wheels thereof, an elongated brake member, including an upper carton engaging surface, and integral means formed at the lower side of said brake member inwardly of its longitudinal extremities nestable with said transverse axles for releasably mounting the brake member longitudinally of said conveyor segment in a stationary position for contacting cartons traversing the conveyor segment by the engaging surface, thereby controlling the rate of movement of the cartons along the conveyor.

5. The conveyor of claim 4, wherein said integral means formed at the lower side of said brake comprises a plurality of longitudinally spaced slots.

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