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C. R. REYNOLDS

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TOE STOP STRUCTURE FOR ROLLER SKATE

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2 Sheets-Sheet 1

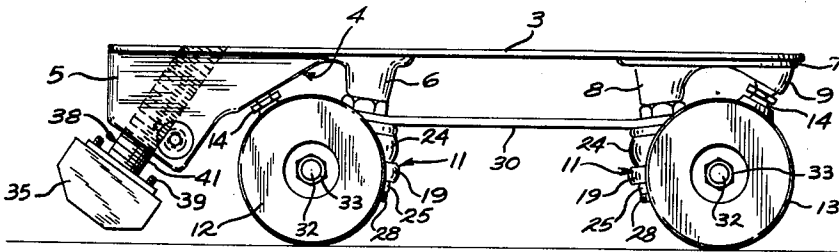


Fig. 1

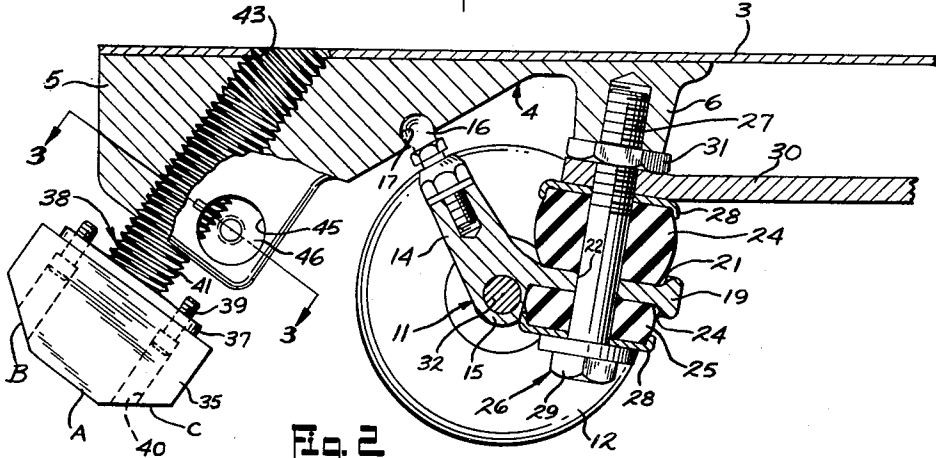


Fig. 2

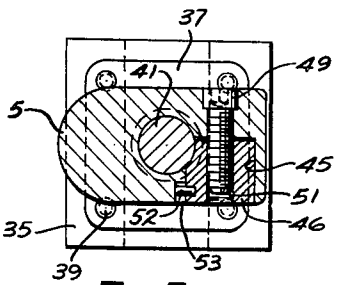


Fig. 3

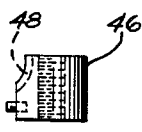


Fig. 4

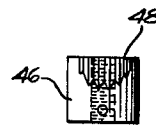


Fig. 5

INVENTOR.
CLARENCE R. REYNOLDS

BY

Hyde, Meyer, Baldwin & Doran

ATTORNEYS

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TOE STOP STRUCTURE FOR ROLLER SKATE

Clarence R. Reynolds, Cleveland, Ohio, assignor to The Cleveland Skate Co., Inc., Cleveland, Ohio, a corporation of Ohio

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1 Claim. (Cl. 280—11.2)

This invention relates to roller skates and more particularly to a new and improved toe stop device for roller skates.

An object of this invention is to provide a roller skate having a new and improved adjustable toe stop device capable of imparting a sudden braking action to the skate.

Another object of this invention is to provide the base plate of a roller skate with a pair of fore and aft rigidly connected trucks which rockably support pairs of rollers and wherein an adjustable resilient toe stop device is integrally connected with the base plate and is movable therewith to contact the supporting floor by pivoting the skate about the axle of the foremost pair of rollers to effect a sudden braking action.

Yet another object of the present invention is the provision of a new and improved toe stop device for roller skates which is selectively axially adjustable to a plurality of predetermined positions above the supporting floor such that the skate may be pivoted or rocked through various arcuate distances about its front rollers in order to bring said devices into braking engagement with said floor.

Still another object of the present invention is the provision of a novel and improved toe stop device for a roller skate including a resilient pad having a plurality of floor engaging surfaces, each of which is preferably formed in a different plane on said pad, and wherein the latter may be selectively adjustable on the skate so as to carry any one of said surfaces into a predetermined position effective to provide a braking action between it and the supporting floor.

Another object of the present invention is to provide a new and improved toe stop device for a roller skate characterized by its structural simplicity, the ease of assembly of its parts, its strong and sturdy nature and its low manufacturing cost. Other features of this invention reside in the arrangement and design of the parts for carrying out their appropriate function.

Other objects and advantages of this invention will be apparent to one skilled in the art to which it pertains upon reference to the following disclosure of several preferred embodiments and which are illustrated in the accompanying drawings forming a part of this specification and wherein:

Fig. 1 is a side elevational view of a roller skate embodying the novel and improved toe stop device of the present invention;

Fig. 2 is an enlarged fragmentary side view, shown partly in central section, of the front portion of the roller skate of Fig. 1;

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is an elevational view of the plug type lock member for retaining the toe stop device of Fig. 1 in its selective adjustable position;

Fig. 5 is a view similar to Fig. 4 but with the lock

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member rotated approximately 90° about its longitudinal axis to more clearly show the serrated jaw formed thereon;

Fig. 6 is an enlarged fragmentary side view and cut away in central section somewhat similar to Fig. 2, but showing another embodiment of toe stop device of the present invention;

Fig. 7 is a sectional view taken substantially on line 7—7 of Fig. 6;

Fig. 8 is an elevational view of another form of plug-type lock member especially adapted for use with the toe stop device of Fig. 6; and,

Fig. 9 is a view similar to Fig. 8 but with the lock member rotated approximately 90° about its longitudinal axis to illustrate the form of serrated jaw provided thereon.

In present day entertainment fields, the use of roller skates to perform intricate and/or precise graceful, dance-like movements has become well known and recognized. The skater or performer, in portraying various types of movements is oftentimes required to suddenly change his direction of movement, for example when exercising a leap or similar step he may find it necessary to completely leave or jump above the skating floor. This action can be best achieved by effecting a sudden stop with the skate, and thence utilizing the force resulting from this movement to initiate the propulsion of the skater in the desired direction.

To accomplish this, the skate may be suddenly stopped by providing the same with a resilient toe stop as referred to in the art, which is brought into engagement with the supporting floor. For example, if the skater, having gained sufficient forward momentum, suddenly engages the floor with the toe stop, he has sufficient force at his command such that he may, if desired, be capable of completely leaving the floor and thereby executing a forward leap, as above referred to. Other types of dance like movements well known to the artist are also capable of being executed, such as quick turns, pivots or similar dance-like movements.

The toe stop device of the present invention is of a novel and improved construction which allows the selective placement of at least one of a plurality of stopping surfaces formed thereon to be located in predetermined spaced relation to the skating floor and thus moved into engagement with the latter by a movement of the skate which is more characteristic of the particular dancing step being performed than heretofore has been possible. It will also be realized that the present form of the stop device enables the stopping surfaces thereon to be brought into engagement with the skating floor by various magnitudes of movement by the skater.

Referring now to the drawings, I have shown herein, merely for purposes of illustration, several preferred embodiments of toe stop device of the present invention as incorporated for use with a form of skate substantially similar to that as disclosed in copending application of Clarence R. Reynolds et al. Serial No. 440,676, filed on July 1, 1954, now Patent Number 2,899,209, issued Aug. 11, 1949. However, it is not intended that the instant disclosure is to define any limitations relating to the inventive concepts of the instant toe stop device, it being obvious that the same may be adapted for use with other well known forms of roller skate.

More specifically, in Figs. 1—5 inclusive, I have shown one embodiment of toe stop device of the present invention as attached to a skate of the type referred to in said copending application, and which comprises in its present form, a base plate 3 preferably formed of cast steel or the like and which normally has a supporting shoe (not shown) rigidly attached to the upper surface thereof. The bottom surface of the base plate 3, at its forward end, is preferably integrally formed with a depending support member 4, the latter, in turn, consisting of a for-

wardly extending abutment portion 5 and a rearwardly disposed truck supporting boss member 6. The base plate 3 is also provided at its rearward end with a roller truck bracket 7 which is rigidly secured to the same by means of welding, riveting or other suitable means. Said bracket, in turn, is integrally formed with depending front and rear boss members 8 and 9, respectively, whose end surfaces incline upwardly and toward each other.

A truck member 11 is adapted to be attached to the front support member 4 and also to the rear bracket 7 in such manner as to rotatably support fore and aft pairs of wheels therefrom, as indicated at 12 and 13 respectively. For this purpose said truck member, as best seen in Fig. 2, comprises a strut member 14 projecting upwardly from a central hub 15 and mounting a ball device 16 on its uppermost end. The truck member supporting the front wheels 12 has its strut member 14 extending forwardly along the base plate 3 in such manner that the aforesaid ball device 16 rockably seats within a socket 17 formed on the rear wall of the abutment portion 5 of the support member 4.

The truck member 11 supporting the aft or rear wheels 13 has its strut member 14 extending upwardly and rearwardly of its hub portion 15, as seen in Fig. 1, such that its ball device 16 seats within a suitable socket formed centrally in the boss 9 of the aforesaid truck bracket 7.

The forward and rear truck members 11 are each additionally provided with an arm 19 which has its one end integrally attached to the hub portion 15 radially spaced from the aforesaid strut member 14 and depending outwardly therefrom much like a cantilever support and terminating a suitable distance therefrom so as to extend underneath the base plate 3. As seen in Fig. 2, the forward truck member 11 is attached to the support member 4 such that the arm 19 depends rearwardly therefrom longitudinally of the base plate 3 and below the boss 6 of the support member 4. And, with reference directed to Fig. 1, the rearward truck member 11 is likewise attached to the boss 9 of the aforesaid truck bracket 7 such that its arm 19 projects forwardly therefrom longitudinally of the base plate 3 and substantially directly beneath the boss 8 of said bracket. Each arm 19 on said forward and rear truck members is also provided with substantially circular dish-shaped cavities 21 formed on each of its opposed surfaces as seen in Fig. 2, being interconnected by an aperture 22 formed centrally through said arm.

The arm 19 on each of the forward and rear truck members 11 is also adapted to be yieldably connected to the base plate 3 of the skate so as to form a shock absorbing support for the wheels carried by the same.

For this purpose, and with particular reference directed now to Fig. 2, the arm 19 on the front and rear truck members 11 has a pair of rubber cushioning blocks 24 and 25 disposed within the aforesaid cavities 21 in such manner as to sandwich the same therebetween. A suitable bolt 26 is extended through said rubber blocks while projecting into and through the aperture 22 in the arm 19. Said bolt, in the front wheel support has its shank threadably received within an internally threaded aperture 27 formed centrally in the boss 6 of the support member 4, while the bolt in the rear wheel support is similarly attached to the boss 8 of the aforesaid truck bracket 7. Suitable metal caps 28 may be placed over the opposed ends of the rubber blocks 24 and 25 and hence provide a bearing surface for the aforesaid bolts and also for the ends of a reinforcing bar 30, which extends between said forward and rear truck members, being mounted over the shank of each of said bolts and interposed between the upper one of said metal caps and a lock nut 31.

In the present form of truck member 11, the hub portion 15 centrally mounts a suitable axle 32 upon which the aforementioned wheels 12 and 13 are rotatably mounted, the latter being retained thereon by means of suitable fasteners, such as nuts 33 threadably disposed on the ends of said axles as seen in Fig. 1.

It will thus be realized that this construction forms yielding shock absorbers, so to speak, for the wheels 12 and 13 as the axle carrying the same pivots about the above described ball and socket connection.

The toe stop device of the present invention is arranged to be attached to the front end of the skate structure just described, and in position to engage with the skating floor and provide a braking effect in response to the skate being rocked or pivoted about its front pair of wheels 12.

Specifically, the embodiment of toe stop device, as shown herein in Figs. 1-5 inclusive, comprises a stop member or pad 35 preferably formed of a rubber like material and having a plurality of floor engaging surfaces as indicated by the reference letters A, B and C. Said stop member is somewhat polygonal in configuration and has its one face suitably bonded to a flat plate 37 of an adjustable adapter member 38. Suitable fasteners such as screws 39 disposed in apertures 40 in said stop member may also threadably engage with the aforesaid flat plate being effective to assist in holding the two together. Said adapter member is also integrally provided with a cylindrical, threaded stem 41, the latter connecting with said plate preferably at its center and projecting outwardly therefrom in substantial perpendicular relation.

The aforementioned abutment portion 5 of the support member 4 is formed with an internally threaded hole 43, which angulates upwardly and rearwardly therethrough, preferably in coaxial relation to the longitudinal axis of the skate base plate 3. The threaded stem 41 is threadably received in said hole, and as is seen in Fig. 2 is adapted to be selectively disposed therein, by screwing stem 41 in or out, such as to position the aforesaid floor engaging surfaces A, B or C of the stop pad in a predetermined spaced relation to the skating floor. Likewise the toe stop may be oriented about the axis of stem 41.

It is contemplated that the stop member 35 be retained in anyone of its preselected positions and for this purpose a bore 45 is formed in the abutment portion 5, extending transversely thereacross and communicating with the aforementioned threaded hole 43. A cylindrical plug 46 is adapted to be placed into said bore and moved therethrough into engagement with the stem 41 of the aforesaid adapter member 38 and thus retain the same in its adjusted position within said threaded hole. As seen particularly in Figs. 4 and 5, the cylindrical plug 46 is preferably formed with a plurality of segmental teeth 48 defining a serrated jaw which extends from the periphery thereof, substantially at the medial part of the same, arcuately inwardly to one end face. The arcuate shape of said teeth is such that with the plug inserted within the bore 45 in the manner as shown in Fig. 3, said teeth communicate with the threaded hole 43 and are disposed within the common opening formed by said communicating bore and hole and thereby take the place of the threaded part of the latter removed as a result of forming the said transverse bore. In other words, the teeth 48 form substantially a continuation of the threads 43 when the serrated jaw is in stem-locking position. In this manner, the plug may be moved within the bore to bring said arcuate teeth into intermeshing engagement with threads on the aforesaid stem 41 of the adapter member 38. For this purpose, a suitable fastener, such as the Allen head screw indicated at 49 in Fig. 3, may be journaled in the abutment portion 5 of the aforesaid support member 4 and threadably received within an aperture 51 formed through the center of the plug 46. Hence, by inserting a suitable Allen wrench in said screw and rotating the same in the proper direction its enlarged head bears against a suitable shoulder 51a and its stem moves into the bore 45 and thus brings the plug 46 into pressure engagement with the stem 41. A suitable key 52 may also be rigidly mounted in said plug adjacent its outer face and adapted to be slidably movable in a keyway 53 formed in said bore and thus be effective to prevent the misalignment of the teeth on the plug with

respect to the threaded stem 41 of the adapter member 38.

With this construction it will now be realized that the toe stop 35 may be readily positioned above the skating floor by simply threading the stem of said adapter member in the proper direction within its companion threaded hole 43, and thus locate the toe stop engaging surfaces A, B or C in any preselected position that is desired. It will likewise be realized that said adapter member may also be disposed such as to locate anyone of said toe stop surfaces at any angle with respect to the skating floor, whereby said surfaces may be more readily adapted to facilitate a pivot or turn by the skater as will be understood by one skilled in the art.

Further, it will also be realized that with the toe stop surfaces A, B or C, disposed at a preselected level above the skating floor the same may be more easily utilized to accomplish a braking action than heretofore possible with a fixed toe stop device. For example, when performing dance-like movements to a slow tempo it may oftentimes be possible to only pivot or rock the skate a slight arcuate distance forwardly about the front wheels 12. In this instance, it would appear desirable to have the aforesaid toe stop surfaces located somewhat close to the skating floor in order to accomplish the aforesaid braking action. Also, in this instance the slight rocking movement of the skate to provide said braking action may appear to be more characteristic of a particular dance movement at this particular tempo.

In the embodiment of toe stop device shown in Figs. 6-9 inclusive, the threaded stem of the adapter member, the latter identified in its present form by the reference numeral 60, is replaced by an elongated stem 61, non-circular and here shown as substantially hexagonal in section as is seen in Fig. 7, and which is adapted to be slidably disposed in a similarly shaped bore 62 provided in the forward end of the abutment portion 5 in preferably the same manner as the aforementioned threaded hole 43 in the previous form.

The stem 61 is additionally provided with a series of parallel spaced annular grooves 63 which lie substantially perpendicular to the longitudinal axis of the same. The plug 64 of the present form of toe stop device may be of any desired configuration, such as the cylindrical form disclosed particularly in Figs. 8 and 9, and which is provided on its one end with separate pairs of spaced teeth 65 and 66, said pairs of teeth being disposed approximately 120° apart so as to correspond to the relative spacing of adjoining faces on the hexagonal shaped stem 61. The spacing between adjacent teeth as indicated by the reference character 68 in Fig. 9 is substantially the same as the width of the land between adjoining annular grooves on the stem, as is indicated in Fig. 6 by the reference character 69.

The plug 64 thus formed, is insertable into a transverse bore 45 in the previous form. Said plug is thence positioned to be carried into engagement with the stem 61 in such manner that the aforesaid pairs of teeth 65 and 66 extend into similarly disposed portions of adjacent grooves on adjoining faces of said hexagonal shaped stem, as indicated in Fig. 7, being effective thereby to retain the said stem and hence the attached toe stop pad member 35 in its preselected adjusted position relative to the skating floor. A fastener, such as an Allen head screw 72 may also be disposed in said abutment portion of the support member 4, and threadably received within the said plug 64 and thus retain the latter in its actuated or engaged condition with the aforesaid stem 61.

With this construction it will now be realized that the

surfaces A, B or C of the toe stop pad member 35 in the instant embodiment may be located at any preselected height above the skating floor by merely sliding hexagonal shaped stem 61 to a predetermined position within its companion bore 62 and then locking the same in this position by extending the teeth 65 and 66 on the plug 64 into the appropriate parts of the annular grooves 63.

It is also realized that the aforesaid pad surfaces may be located in various predetermined angular positions above the skating floor by removing the hexagonal-shaped stem 61 of the adapter member 60 from its companion bore 62, turning it about the axis of stem 61, and reinserting the same in such manner that different adjoining faces of said stem are presented to and engaged by the locking plug 64.

Having thus described several preferred embodiments of the toe stop device of the present invention it is of course realized that the same is susceptible to various modifications and arrangements of parts without departing from the inventive concepts herein disclosed. For instance, it is apparent that the stem of the adapter member may be any one of a plurality of various shapes other than the circular and hexagonal configuration herein shown. Likewise, the locking plug need not be limited to the cylindrical shape disclosed, but may also partake of any suitable non-cylindrical configuration. In all forms of the invention, a fastening is provided for the toe stop which is effective to hold the stop in its predetermined position against the powerful forces exerted when a skater, traveling at some speed, suddenly engages the toe stop against the floor.

What is claimed is:

In a roller skate having a base plate supporting pairs of front and rear wheels, the combination therewith of a toe stop device, comprising a support member on said base plate depending downwardly therefrom and forwardly of said pair of front wheels, a floor engaging resilient pad having a plurality of floor engaging surfaces, an adapter member having a flat plate removably mounting said pad on its one face, a stem rigidly attached to the opposite face of said plate and extending outwardly therefrom in a direction substantially opposite to said pad, means defining a plurality of generally parallel grooves on said stem spaced apart at a predetermined interval, a receptacle in said support member for slidably receiving said stem, means defining a bore in said support member extending transversely of and communicating with said receptacle, a plug slidably disposed in said bore and having a plurality of generally parallel grooves spaced at the same predetermined interval as the grooves in said stem, and locking means disposed wholly within said support member being engageable with said plug and operable to move said plug into interlocking engagement with said stem and effective to lock said stem in a preselected actuated position in said receptacle and to space at least one of said floor engaging surfaces on said pad in a predetermined raised position above a skating floor.

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