United States Patent [19]

Tomizawa

[11] **3,797,895**

[45] **Mar. 19, 1974**

[54] **LOWER TRACK ROLLER FOR CRAWLER TRACK**

[75] Inventor: **Kazuhiro Tomizawa,** Chiba, Japan

[73] Assignee: **Nittai Lease Company Ltd.,** Tokyo, Japan

[22] Filed: **Feb. 22, 1972**

[21] Appl. No.: **228,040**

[30] **Foreign Application Priority Data**

Feb. 24, 1971 Japan 46-9163

[52] **U.S. Cl.** **305/27,** 152/49

[51] **Int. Cl.** **B62d 55/16**

[58] **Field of Search** 305/27, 28; 152/47, 41, 152/49, 50

[56] **References Cited**

UNITED STATES PATENTS

698,110	4/1902	Foy	152/47
3,147,048	9/1964	Johnson	305/28
2,033,862	3/1936	Piron	152/41
165,587	7/1875	Jeantaud	152/47
2,830,637	4/1958	Deuring	152/49
3,580,093	5/1971	Tomizawa	152/50
3,689,122	9/1972	Mazzarins	305/27

Primary Examiner—Richard J. Johnson

Attorney, Agent, or Firm—Davis, Hoxie, Faithfull & Hapgood; William F. Sonnekalb, Jr.

[57] **ABSTRACT**

A lower track roller having a resilient buffer means positioned between the roller body and the tread ring.

6 Claims, 2 Drawing Figures

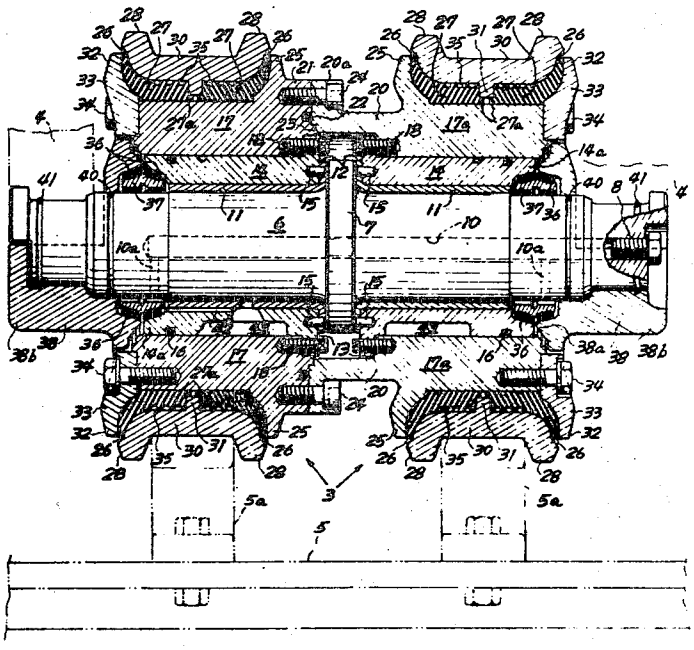


FIG. 1

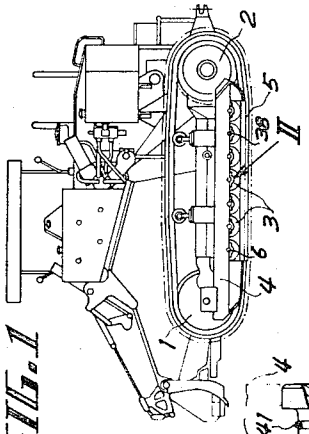
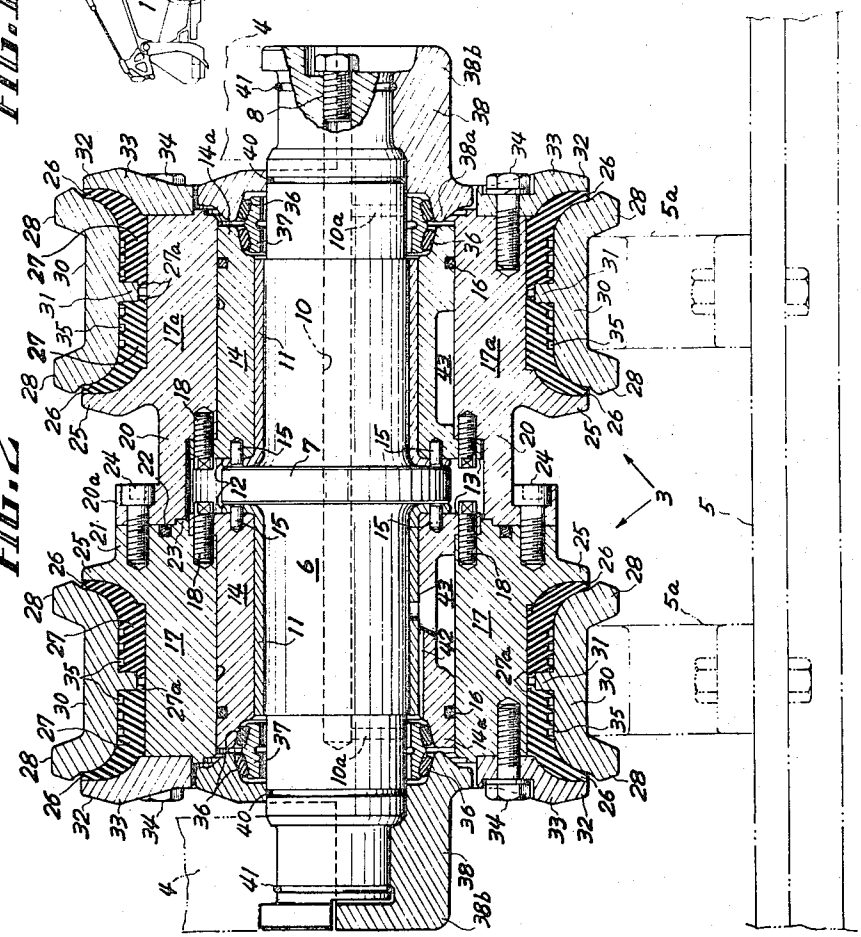


FIG. 2



LOWER TRACK ROLLER FOR CRAWLER TRACK

The present invention relates to heavy construction machines, e.g., bulldozers, shoveldozers and the like, and more specifically to improvements in the lower track rollers for the crawler tracks of such machines.

Presently known lower track rollers for endless crawler tracks of conventional bulldozers, shoveldozers and the like have various drawbacks. Specifically, when the lower track rollers are subjected to a large impact load during excavation work, e.g., pushing, digging and transporting, the lower track rollers vibrate resulting in decreased roller life and often breakage. Further, this vibration causes noise which results in an unpleasant working environment.

It is an object of the present invention to overcome the drawbacks of existing lower track rollers.

It is a further object of the present invention to provide a lower track roller which will allow sustained machine operation at high speeds and increase machine life.

It is a further object of the present invention to provide means for substantially eliminating roller vibration.

It is still a further object of the present invention to substantially eliminate roller noise.

Other objects, aspects and advantages of the present invention will be more apparent when the detailed description is considered with the drawing.

Briefly, the present invention includes a roller body having a pair of flanges to receive a resilient buffer ring. A bearing support is mounted on the axle of the roller and the roller body is mounted on the bearing support. One of the pair of flanges of the roller body is removable and the resilient buffer ring is mounted on the roller body and held between the flanges. The resilient ring has a pair of flanges for receiving a tread ring and a central step for receiving an annular seating ring which depends from the tread ring.

The invention is illustrated with the following drawing, in which:

FIG. 1 is a side elevational view of a bulldozer having lower track rollers in accordance with the present invention; and

FIG. 2 is a vertical cross-sectional view of a lower track roller indicated by II in FIG. 1.

Referring to FIG. 1, an idler sprocket 1 is operatively connected to a driving sprocket 2 through a crawler track 5. Lower track rollers 3 are rotatably mounted on shafts 6 which are bolted to the frame 4 of the bulldozer.

Various details of one of the lower track rollers 3 are shown in FIG. 2. The rollers 3 include a shaft or axle 6 with an outwardly extending flange 7 arranged at the center thereof. An oil supply port 8 is arranged in one end of the axle 6. The oil supply port 8 communicates with an oil duct 10 extending longitudinally through the axle 6 along its axis. Branch oil holes 10*a* extend radially from the oil duct 10 to the exterior of the axle 6.

A pair of cylindrical bearings 11, 11 are rotatably mounted on the axle 6, and have outwardly extending flanges 12, 12 at their inner ends. The bearings 11, 11 are mounted on cylindrical bearing support members 14, 14 which have outwardly extending flanges 13, 13 at their inner ends. The inner ends of the bearing supports 14, 14 and the flanges 12, 12 of the bearings 11, 11 are fixedly connected to each other by pins 15, 15.

Roller bodies 17, 17*a* are mounted in tandem on the bearing supports 14, 14. Near the ends of the outwardly facing surfaces of the bearing supports 14, 14 in circumferential grooves are positioned sealing rings 16, 16 which engage roller bodies 17, 17*a*. The outwardly extending flanges 13, 13 of the bearing supports 14, 14 and inner ends of the roller bodies 17, 17*a* are fixedly connected to each other by bolts 18, 18. The assembled bearings 11, 11, bearing supports 14, 14 and roller bodies 17, 17*a* are mounted on the axle 6.

The roller body 17a has a cylindrical extension 20 with a flange 20*a* extending outwardly from the end of the cylindrical extension 20. The flange 20*a* mates with the end portion 21 of roller body 17. The end portion 21 includes an annular step 23 and the flange 20*a* an annular recess which mates with the annular step 23. The roller bodies 17, 17*a* are connected to each other by bolts 24; watertight engagement between the roller bodies 17, 17*a* is provided by sealing ring 22 which fits in an annular recess in roller 17 and engages roller 17*a*.

The roller bodies 17, 17*a* have inner and outer flanges 25 and 32 extending outwardly from their outer periphery to receive a pair of resilient buffer rings 27, 27 and a pair of tread rings 30. The resilient buffer rings 27 are substantially U-shaped and may be advantageously made of two pieces as shown in FIG. 2 or one piece if desired. The resilient buffer rings 27 are fixedly mounted on the roller members 17, 17*a* and by cooperation between inner flanges 25 of the roller bodies 17, 17*a* and outer flanges 32 of end covers 33. The end covers 33 are removable and are secured to the roller bodies 17 and 17*a* by bolts 34.

Each resilient buffer ring 27 has a flange 26 at one end and a step portion 27*a* at the opposite end. The tread ring 30 has a pair of outwardly extending flanges 28 at its ends which engage and substantially overlie the flanges 26 of the resilient buffer rings 27. Further, each tread ring 30 has an annular seating ring 31 depending from the inner surface thereof. The annular seating ring 31 is dimensioned to be received in the annular channel formed between the assembled resilient buffer rings 27 and seats on juxtaposed step portions 27*a*. The tread ring 30 is mounted on a pair of resilient buffer rings 27 and compressively held thereagainst by the compressive force exerted on the tread ring 30 through the pair of resilient buffer rings 27 by the flanges 25 and 32. When the tread ring 30 is subjected to an axial load, the load is distributed over the pair of resilient rings 27 with the aid of the annular seating ring 31; thereby preventing damage to the flanges 26 of the resilient rings 27.

The resilient buffer rings 27 should be made of a durable resilient material, e.g., synthetic rubber or polyurethane, and may advantageously include a plurality of annular grooves 35 extending circumferentially therearound which function as shock absorbers.

At each end of axle 6 are mounted roller supporting members 38. Annular sealing rings 36, 36 and annular supporting rings 37, 37 are positioned in an annular recess formed between the axle 6 and the annular projections 14*a* of the bearing supports 14, 14 and the annular projections 38*a* of supporting members 38. Axle 6 also includes annular sealing rings 40 positioned in circumferential grooves for engagement with the end covers 33, and annular stop rings 41 which control the longitudinal position of the supporting members 38 on the axle 6. The branched oil holes 10*a* communicate with

the interior of the supporting rings **37, 37** and further communicate with oil pockets **43** provided in the bearing supports **14, 14** and bearings **11, 11** through oil paths **42.** The outer projections **38***b*, **38***b* of the supporting members **38, 38** are secured to the frame **4** by bolts.

Both ends of the axle **6** of the lower track roller **3** are engaged by frame **4** which has semi-circular recesses in its underside.

The assembled lower crawler track roller **3** is connected to the endless crawler track **5** through a pair of links **5***a*. The links **5***a* have one end bolted to the crawler track **5** and the other end riding on tread rings **30.**

Advantageously, the resilient buffer rings **27** arranged between the roller bodies **17, 17***a* and the tread rings **30** absorb the shock from the frame **4** and the crawler track **5,** preventing vibration (and noise), enabling an increase in operational speed and increased machine life.

It should be apparent to those skilled in the art that various modifications may be made in the lower track roller of the present invention. The description and drawing should be considered as only illustrative of the principles of the present invention and should not be construed to unduly limit the claims.

What is claimed is:

1. A lower track roller for use with a crawler track of a heavy construction machine, comprising:

an axle;

roller body means rotatably mounted on said axle;

said roller body means having two pair of flanges, each pair of flanges including inner and outer outwardly extending flanges spaced relative to one another to form an annular channel;

a pair of U-shaped resilient buffer rings, one of said resilient buffer rings positioned within each of said channels, each of said resilient buffer rings having a pair of outwardly extending flanges which contact and are compressively retained by said inner and outer flanges of said annular channels, said resilient buffer rings including an annular recess; and

a pair of annular tread rings, each of said annular tread rings mounted, respectively, on one of said buffer rings, each of said annular tread rings having a pair of outwardly extending flanges which engage said flanges of said resilient buffer rings, said tread rings each including an annular seating ring depending therefrom, said annular seating rings being seated within said annular recesses of said resilient buffer rings.

2. A lower track roller as claimed in claim **1** wherein:

each of said resilient buffer rings includes a pair of identical resilient rings having step portions;

said annular seating rings are received between each of said assembled pairs of resilient rings and seat on said juxtaposed step portions.

3. A lower track roller as claimed in claim **1** wherein:

said flanges of said tread rings have portions which substantially overlie said flanges of said resilient buffer rings.

4. A lower track roller as claimed in claim **1** wherein:

the outer flanges of said roller body means are adjustable for compressively retaining said resilient buffer rings between said inner and outer flanges of said respective pair of flanges of said roller body means.

5. A lower track roller for use with a crawler track of a heavy construction machine, comprising:

an axle;

roller body means rotatably mounted on said axle;

said roller body means having inner and outer outwardly extending flanges arranged thereon;

a resilient buffer means mounted on said roller body means and having a pair of outwardly extending flanges which contact and are retained by said inner and outer flanges of said roller body means, said resilient buffer means including a pair of identical resilient rings having step portions;

each of said resilient rings having a plurality of annular grooves in its outer surface to absorb shock;

said tread ring having a depending annular seating ring which is received between said assembled pair of resilient rings and seats on said juxtaposed step portions;

at least one of said flanges of said roller body means being adjustable for compressively retaining said resilient buffer means between said flanges of said roller body means.

6. A lower track roller for use with a crawler track of a heavy construction machine, comprising:

an axle;

roller body means rotatably mounted on said axle;

said roller body means having inner and outer outwardly extending flanges arranged thereon;

a resilient buffer means mounted on said roller body means and having a pair of outwardly extending flanges which contact and are compressively retained by said inner and outer flanges of said roller body means, said resilient buffer means including an annular channel;

a tread ring mounted on said resilient buffer means and having a pair of outwardly extending flanges at its ends which engage said flanges of said resilient buffer means, said tread ring including an annular seating ring depending therefrom, said annular seating ring being seated in said annular channel; and

said resilient buffer means is a resilient ring having a plurality of annular grooves at its outer surface to absorb shock.

* * * * *