A. G. E. HULTGREN.

FEEDING DEVICE FOR ANNULAR BODIES.

APPLICATION FILED AUG. 10, 1918.

1,396,116.

Patented Nov. 8, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

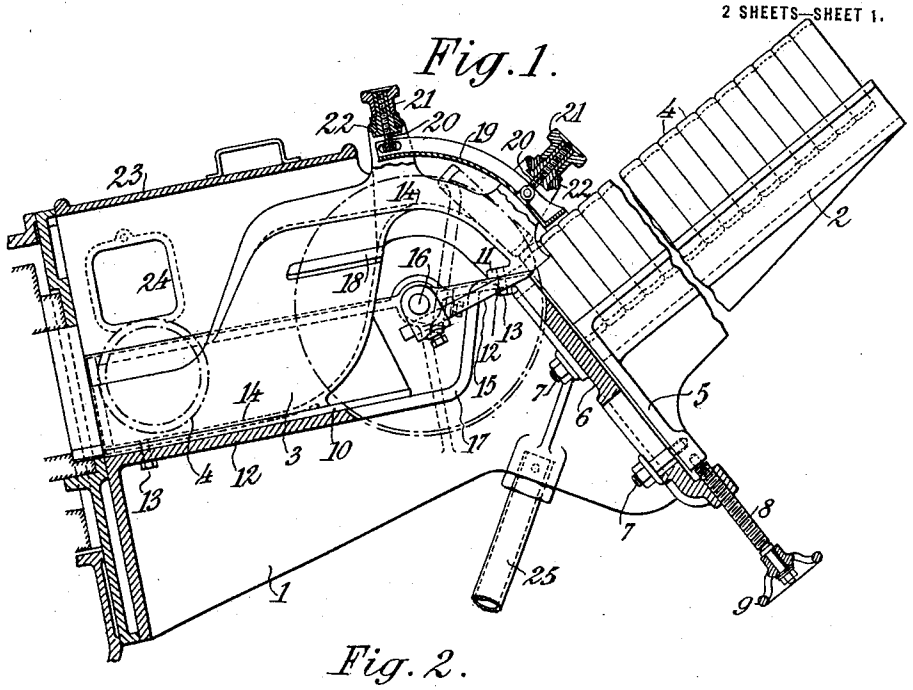
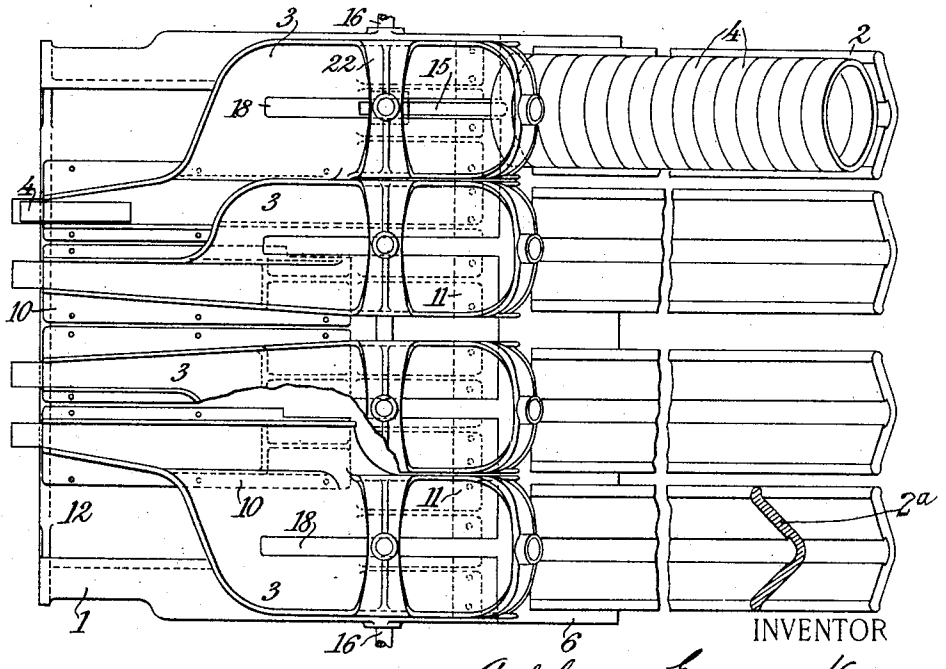


Fig. 2.



INVENTOR

Axel Gustaf Emanuel Hultgren

By Attorneys,

Fraser, Dunk & Myers

WITNESS:

Peni Spruine

A. G. E. HULTGREN.

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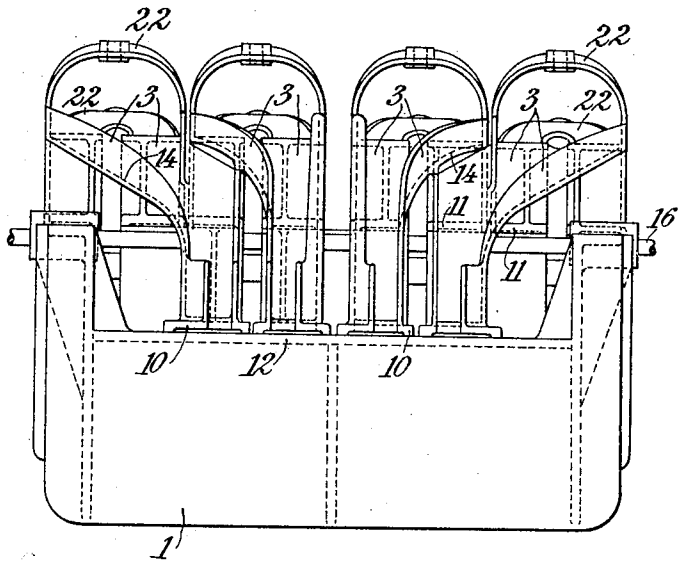
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2 SHEETS—SHEET 2.

Fig. 3.



INVENTOR

Axel Gustaf Emanuel Hultgren

By Attorneys,

Fraser, Durle & Myers

WITNESS:

René Prime

UNITED STATES PATENT OFFICE.

AXEL GUSTAF EMANUEL HULTGREN, OF GOTTENBORG, SWEDEN, ASSIGNOR TO AKTIEBOLAGET SVENSKA KULLAGERFABRIKEN, OF GOTTENBORG, SWEDEN, A CORPORATION OF SWEDEN.

FEEDING DEVICE FOR ANNULAR BODIES.

1,396,116. Specification of Letters Patent. Patented Nov. 8, 1921.

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To all whom it may concern:

Be it known that I, AXEL GUSTAF EMANUEL HULTGREN, a subject of the King of Sweden, residing at Gottenborg, in the Kingdom of Sweden, have invented new and useful Improvements in Feeding Devices for Annular Bodies, of which the following is a specification.

This invention relates to feeding devices for annular bodies, particularly track-rings for ball and roller bearings.

The primary object of the invention is the provision of a feeding device of the kind aforementioned in which the annular bodies are passed in a simple and reliable manner from a position in which they are cepable of moving in axial direction to a position in which they move at right angles to said direction, the first named movement being a sliding movement, whereas the latter one is a rolling movement. In the starting position the plane side surfaces of the bodies bear, preferably, against each other, while in the final position their cylindrical outer surfaces are in contact with each other.

The device is especially adapted for use in machines, furnaces or the like to which rings are supplied continuously for further treatment.

For the purpose mentioned above the device consists, chiefly, of a magazine in which the rings are placed with the plane side surfaces facing each other and in which they are caused to perform a sliding movement in axial direction, a channel or the like being connected with the magazine, the bottom of said channel being so formed that the rings, when moving thereon, are passed successively to a position in which they move at right angles to the axial direction. Furthermore, the device comprises means for passing the rings from the magazine to the channel. In the starting position the rings rest, preferably, on the bottom of the magazine, said bottom being suitably inclined in such manner as to cause the rings, owing to their own weight, to effect an axial sliding movement on removing the ring next to the channel from the magazine. Preferably, also the end of the bottom directed away from the magazine is so inclined as to cause the rings to move on account of their own weight for instance with a rolling movement.

An embodiment of the invention applied to a device having four magazines and channels operating in parallel is shown in the accompanying drawings in which:—

Figure 1 is a partial vertical section through the device. Fig. 2 is a horizontal view of the same, the protecting cap being removed. Fig. 3 is an end view of the device.

Referring to the drawing, the device shown is supposed to be connected with the inlet end of a furnace. 1 denotes a frame supporting the magazines 2 and the channels 3 as well as the device passing the rings 4 from the magazines to the channels. Each magazine 2 consists, in the embodiment shown, of a straight channel of angular cross-section (shown at 2^a in Fig. 2) in which the rings 4 are placed with the plane side surfaces bearing against each other, as shown in Fig. 1. Because of such a placing of the rings, the length of the magazine is reduced as far as possible for a certain number of rings. Each magazine or channel 2 is at the inner end provided with a flange 5 connecting the magazine with the inclined rear wall 6 of the frame 1, the magazine thereby obtaining an inclined position enabling the rings to slide on the magazine. The magazine is adjustably attached to the wall 6 and provided with screws 7 with nuts serving to lock the magazine in adjusted position. The adjustment of the magazine is effected by means of a screw 8 screwed into the lower part of the wall 6 and provided with a hand-wheel 9. Thus the device may be used for rings of various sizes.

One end of the channel 3 by the aid of which the position of the rings is changed is connected to the upper portion of the wall 6 of the frame bounding the magazine, while the other end of the channel opens into the furnace. The foot plates 10 and 11 of the channel 3 rest on the bottom 12 of the magazine, the channel being retained by means of screws 13 or the like. The bottom 14 of the channel 3 is curved in such manner that the rings, when moving along

the same, are moved upward in oblique direction, the plane side surface of the rings sliding on the bottom of the channel, as shown by stippled lines at the top of Fig. 1, until they are out of contact with the subsequent ring in the magazine. Then the rings, while effecting a swinging movement, slide downward obliquely in a plane forming an angle with the first-named plane of movement. After that the rings thus are caused successively to place themselves on the edge at the foremost inclined portion of the bottom, as shown by stippled lines to the left in Fig. 1; the rings finally roll downward into the furnace.

The device for passing the rings from the magazine 2 to the channel 3 consists, in the embodiment shown, of grip arms 15, one for each magazine, secured to a rotating shaft 16 journaled in the frame 1. The shaft 16 is actuated by any suitable moving device not shown in the drawing. The frame 1 and the channels 3 are provided with apertures 17 and 18 respectively enabling the arms to move as mentioned. To prevent the rings 4 from swinging out of contact with the grip arms 15, when moving upward from the magazine, owing to the pressure exerted by the subsequent rings, the portion of the channel 3 adjacent to the magazine is provided with a cover 19 serving as a guide for the rings. The part of the cover 19 adjacent to the magazine serves as a stopper for the rings preventing the ring located at the corresponding end of the magazine from following the ring situated next to the channel on account of the friction. The cover 19 is supported by two screws 20 with nuts 21 journaled rotatably but not movable longitudinally in yokes 22 extending across the channel 3 thus enabling the cover 19 to be adjusted in relation to the bottom of the channel according to various widths of the rings. Besides, all the channels 3 are covered by a removable cap 23 provided with an inspection aperture 24, which may be closed by a cover 26.

As mentioned above, the frame 1 and the magazines with the channels are supposed to be connected with the inlet end of a furnace not shown in the drawing and are supported by suitable stays 25.

It is not to be inferred from the particular illustration and description herein given of the preferred construction of machine embodying the invention, that the latter is limited to such specific construction, since in fact the invention is susceptible of a considerable range of variations within the scope of the appended claims, and in accordance with the specific annular objects to be handled and the particular purpose to be subserved.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A device for feeding rings, comprising an inclined magazine adapted to support a stack of rings face to face at such angle that they slide to its lower end by gravity, automatic feeding means for successively pushing the lower end ring in its own plane obliquely out of the magazine, a discharging incline, and means for turning the ring from its oblique feeding plane to a vertical plane and delivering it onto such incline, so that the successive rings may roll by gravity away from the magazine.

2. A feeding device according to claim 1, the turning means adapted to effect a partial turning of the ring prior to the release of the ring by the feeding means.

3. A feeding device according to claim 1, the turning means comprising a channel engaging the rings to impart to them the desired tilting movement in their transit through it.

4. A feeding device according to claim 1, the feeding means comprising an arm adapted to engage successively the bottom rings and push them from said magazine in the direction of their plane.

5. A feeding device according to claim 1, wherein the transferring means comprises a rotary shaft and a radial arm, the latter adapted to engage successively the inner periphery of the bottom ring in the magazine and push it out therefrom.

6. A feeding device according to claim 1, wherein the feeding means comprises a rotary shaft and a radial arm, the latter adapted to engage successively the bottom rings in the magazine to push them out therefrom.

7. A feeding device according to claim 1, wherein the magazine comprises an inclined frame and means for adjusting said frame to adapt it to rings of varying sizes.

8. A feeding device according to claim 1, having a cover adapted to guide the rings in their passage from the magazine to the turning means.

9. A feeding device according to claim 8, the said cover being movable and having means for adjusting it.

10. A device for feeding rings, comprising an inclined magazine in which they are stacked face to face, means for feeding them out one by one from the bottom of such magazine, an inclined outlet down which the rings may roll away by gravity, and means for turning the rings from the position in which they are fed out from the magazine, into a vertical plane, and delivering them at such outlet.

11. A device for feeding rings, comprising an inclined magazine in which they are stacked face to face, movable feeding means for engaging repeatedly the bottom ring of

such magazine and pushing it out therefrom by an upward inclined movement in approximately its own plane, means for turning the ring in its advancing movement and delivering it in a vertical plane, and a discharge outlet having an inclined bottom down which the fed ring may roll away.

12. A device for feeding rings, comprising an inclined trough-like magazine in which they are stacked face to face and down which they may slide by gravity, a rotary part adapted to successively engage the ring at the bottom of such magazine and push it out therefrom, means for turning the rings into a vertical plane, comprising guiding walls forming a channel for tilting the rings in transit, and an outlet having an inclined bottom down which the rings may roll away.

In testimony whereof I have signed my name.

AXEL GUSTAF EMANUEL HULTGREN.