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FEEDING MECHANISM

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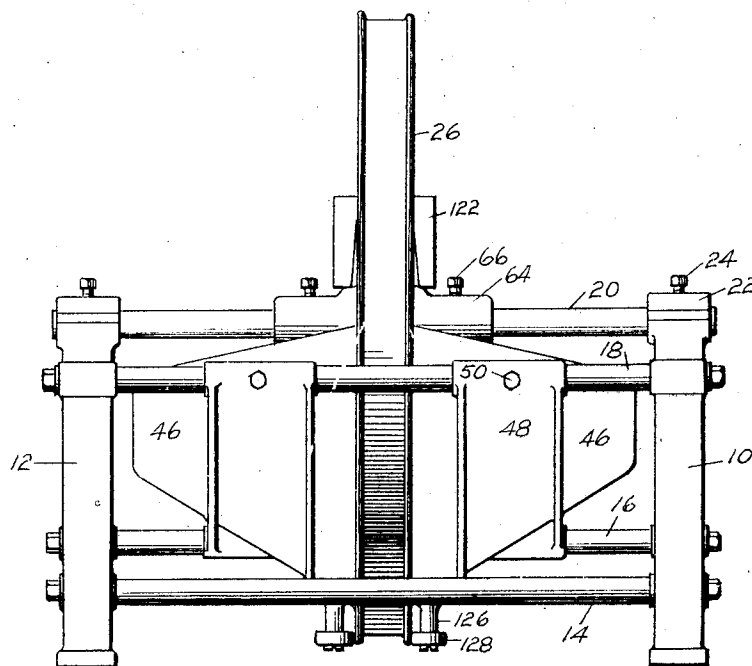


FIG. 4.

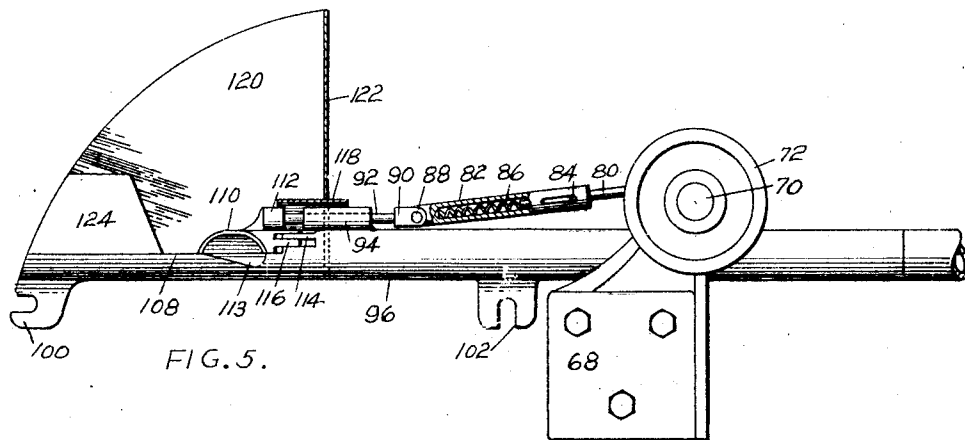


FIG. 5.

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FEEDING MECHANISM.

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This invention relates to feeding mechanisms and comprises all the features of novelty herein disclosed, by way of example, as embodied in mechanism for feeding articles, such as cylindrical rollers, in a continuous stream.

An object of the invention is to provide a simple and inexpensive mechanism for feeding articles, as from a hopper to a gravity feed pipe. Another object is to provide mechanism for rapidly and effectively feeding articles having a considerable range of sizes.

To these ends and to improve generally upon devices of this general character, the invention also consists in the various matters hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation.

Figure 2 is a plan view partly in section. Figure 3 is an enlarged section on the line 3—3 of Figure 1.

Figure 4 is a front elevation.

Figure 5 is an enlarged view, partly in section, of the agitator mechanism.

In the disclosed mechanism, articles, such as cylinders, are dumped into a hopper at the side of a rotary wheel having radial blades which lift the articles to a steeply inclined position whence the articles slide endwise one after another into a feed pipe having an agitator. Side frames 10 and 12 are rigidly connected by cross rods 14, 16 and 18 and by a cross shaft 20 which is held against rotation by being keyed to cap pieces 22. Set screws 24 clamp the keys and shaft against endwise movement. A feed wheel 26 is rotatably mounted on roller bearings 28 operating between thrust washers on the shaft, the washers abutting shoulders 34 on the shaft and cap plates 36 on the wheel hub.

The wheel has a groove in its periphery for a driving belt 38 and on each side of the wheel is an annular portion in the form of a recess 40 for a series of sectoral plates 42 having straight radial blades or vanes 44 constituting article holders and lifters inclined upwardly a little from the side of the wheel. The lower portion of the wheel extends between a pair of hoppers or article receptacles 46, each hopper being open towards the wheel and its blades. The hoppers have front supporting arms 48 clamped to the cross rod 18 by set screws 50 and rear supporting arms 52 clamped to the cross rod

16 by set screws 54. Each hopper has an inclined bottom and is higher towards the front which is the direction in which the wheel tends to carry the articles. Each hopper is of generally arcuate form to conform to the side of the wheel. As the wheel revolves slowly clockwise in Figure 1, the articles gather on the blades and are lifted; several articles may occupy a blade in alignment with one another. Thus the blades form article lifting and arranging means and direct the articles towards the axis of the wheel.

To prevent the articles from sliding radially inwardly on the blades until they have a considerable inclination, an arcuate shield or flange 58 on a supporting plate 60 is set into a central circular recess 62 in each side of the wheel inside of the inner ends of the blades 44. The plate 60 is substantially semicircular and is held in a fixed position by keying its hub 64 to the shaft and clamping it with a set screw 66. The plate 60 closes a portion of the open side of the hopper inside of the blades. Over the plate 60 at the upper end of the shield or flange 58 is an inclined article guide or pipe as will hereinafter appear.

To each plate 60 is bolted a bracket 68 forming a journal for a shaft 70 driven by a belt pulley 72. Each shaft has a head 74 with a crank pin pivoted to an eye on a telescoping link comprising a rod section 80 and a housing section 82. A cross pin 84 on the rod section 80 is guided by a slot in the housing section 82 and is pressed towards its extended position by a coiled spring 86 in the housing. The end of the housing has an eye pivotally connected by a removable pin 88 to a fork 90 on a rod 92 slidable in a supporting sleeve 94 welded or otherwise secured to an article guide or pipe 96. Each pipe has a hook 100 slightly offset from its under side and a fork 102 on its under side for quick-detachable engagement with thumb screws 104 and 106 threaded in the supporting plate 60. Pipes of different diameters, depending on the size of the articles, can thus be quickly substituted for one another. Each pipe 96 rests on an inclined flange 105 on the plate 60 and extends away from the wheel, at a slight angle from a point in the plane of the blades. Each pipe is suitably connected to an inclined extension pipe 107 and conducts the articles across the side of the wheel from

the inner edge of the annular blade carrying portion of the wheel.

The upper half of the pipe 96 is cut away near the end as at 108 and a semi-cylindrical pipe section 110, having its end cut on a slant, slides on the pipe 96. The pipe section 110 forms a reciprocating agitator and cam which is welded or otherwise secured to a collar 112 fixed on the end of the sliding rod 92. Articles that stand on end in the open part of the pipe are knocked off by the cam and a notch 113 in the pipe facilitates this action. To guide the agitator without any material interruption in the continuity of the article guide, the pipe 96 and the pipe sections 110 have correspondingly spaced fingers 114 and 116 which interfit with one another. A U-shaped guard 118 encloses the joint and is supported and carried by the collar 112.

To guard the actuating mechanism of the agitator from injury due to falling articles which do not enter the pipe, a sector plate 120 having a lateral guard flange 122 is attached to the side of the pipe, the flange 122 being slotted to embrace the U-shaped guard 118. The article lifting blades raise an excess of articles to the pipe, that is, more than can be fed through the pipe, and these extra articles are directed by the flange 122 back to the hopper. A plate 124 is welded to the upper edge of the open portion of the pipe 96, opposite the plate 120, and directs the articles into the pipe endwise. The spring 86 in the agitator mechanism will give if the agitator becomes clogged. The feeding mechanisms at the opposite sides of the wheel are preferably alike as this simplifies the mechanism and produces advantageous balancing features because the weight of articles in the hoppers acts in opposite directions and equalizes side thrusts. To further prevent canting of the wheel due to a possible inequality of loads in the hoppers or due to the use of one hopper alone, each hopper has a bracket 126 with a rotary thrust roller 128 to engage the wheel near the rim.

In operation, a load of articles such as cylindrical rollers is dumped into each hopper. Rotation of the wheel causes the blades 44 to wipe across the open ends of the arcuate hoppers and pick up rollers some of which naturally take a radial position on the blades. The rollers are lifted to the feed pipe 96 meanwhile being held on the blades by the arcuate shield 58. As the rollers on each blade reach the feed pipe, they slide endwise into it by gravity and form a stream of rollers which can be conducted by gravity through the extension pipe 107 to any machine for treatment. Entrance of the rollers to the pipe is facilitated by the agitator and any excess rollers, beyond the capacity of the pipe, drop back into

the hopper. For larger rollers, a larger pipe is used with its hook 100 and pipe 102 suitably placed to make the pipe clear the wheel at a slight angle.

The invention, in its broader aspects, is not necessarily limited to the particular embodiment selected for mere illustrative purposes.

I claim:

1. In apparatus of the character described, in combination, a wheel having a series of article lifting blades, said blades being straight and radially arranged on the side of the wheel, a hopper for articles at the side of the wheel, an inclined guide at an angle to the side of the wheel, means for turning the wheel to lift the articles from the hopper to the guide, and an agitator to facilitate the passage of articles through the guide; substantially as described.

2. In apparatus of the character described, in combination, a hopper for articles, a wheel extending across an open side of the hopper and having a plurality of article lifting blades projecting laterally towards the hopper from the side of the wheel and radially arranged, an arcuate shield for retaining articles on the blades, and an inclined article guide at the end of the shield; substantially as described.

3. In apparatus of the character described, in combination, a hopper for articles, a wheel extending across an open side of the hopper and having a central recess, a plurality of article lifting blades on the side of the wheel and extending radially from the central recess, an arcuate shield in the central recess and extending upwardly from the hopper, and an inclined article guide at the upper end of said shield; substantially as described.

4. In apparatus of the character described, in combination, a hopper for articles, a rotary wheel extending across an open side of the hopper, a plurality of article lifting blades on the side of the wheel and extending radially from a central recess, an arcuate shield extending across the inner ends of some of the blades, a stationary plate carrying said shield and closing a portion of the side of the hopper, and an article guide supported by said plate and inclining downwardly away from the upper end of said shield; substantially as described.

5. In apparatus of the character described, in combination, a hopper for articles, a rotary wheel, extending across an open side of the hopper, a plurality of article lifting blades on the side of the wheel and extending radially from a central recess, an arcuate shield extending across the inner ends of some of the blades, a stationary plate carrying said shield, an article guide supported by said plate and inclining downwardly away from the upper end of said shield, and an agitating mechanism

supported by said plate for directing articles into the guide; substantially as described.

6. In apparatus of the character described, in combination, a wheel having on each side a series of article lifting blades, a hopper at each side of the wheel and communicating therewith, means for turning the wheel to cause the blades to lift articles from the hopper, and means at each side of the wheel for conducting articles away from the blades in a stream, the conducting means at the sides of the wheel being operable simultaneously; substantially as described.

7. In apparatus of the character described, in combination, a wheel having a series of article lifting blades on its side, a hopper for articles at the side of the wheel, means for turning the wheel to cause the blades to lift articles from the hopper, means for conducting the articles away from the blades in a stream, and a thrust roller opposite the hopper and engaging the wheel to prevent canting of the wheel; substantially as described.

8. In apparatus of the character described, in combination, a frame, a shaft fixed to the frame, a wheel rotatable on the shaft and having article lifting means, a hopper communicating with the lower side portion of the wheel, a plate fixed to the shaft and entering a central recess in the side of the wheel, and an inclined pipe fixed to the plate and extending away from the article lifting means near the upper portion of the wheel; substantially as described.

9. In apparatus of the character described, in combination, a frame, a shaft fixed to the frame, a wheel rotatable on the shaft and having article lifting means, a hopper communicating with the side of the wheel, a plate fixed to the shaft at the side of the wheel, an inclined pipe fixed to the plate and extending away from the article lifting means, and a reciprocating agitator on the pipe; substantially as described.

10. In apparatus of the character de-

scribed, in combination, a frame, a shaft fixed to the frame, a wheel rotatable on the shaft and having article lifting means, a hopper communicating with the side of the wheel, a plate fixed to the shaft at the side of the wheel, an inclined pipe fixed to the plate and extending away from the article lifting means, an agitator on the pipe, and mechanism supported by said plate for causing reciprocation of the agitator; substantially as described.

11. In apparatus of the character described, in combination, a feeding wheel, an inclined pipe leading from said wheel and having a cut out portion, a pipe section fitting in said cut out portion, and means for reciprocating said pipe section; substantially as described.

12. In apparatus of the character described, in combination, a feeding wheel, an inclined pipe leading from said wheel and having a plurality of spaced fingers, a pipe section having correspondingly spaced fingers to fit between said first fingers, and means for reciprocating said pipe section; substantially as described.

13. In apparatus of the character described, in combination, a feeding wheel, an inclined pipe leading from said wheel and having its upper portion cut away at one end, a semi-cylindrical pipe section fitting in said cut away portion and having its end portion bevelled, and means for reciprocating said section; substantially as described.

14. In apparatus of the character described, in combination, a rotary feeding wheel having radial blades, a stationary supporting plate in a recess of said wheel, an inclined pipe leading away from said wheel from a point adjacent to the path traversed by the inner ends of said blades, and a quick detachable connection between the pipe and the supporting plate; substantially as described.

In testimony whereof I hereunto affix my signature.

FRED C. GRISWOLD.