May 8, 1928.

E. SÄLL

1,669,307

FEEDING DEVICE

Filed Jan. 18. 1927

Fig. 1

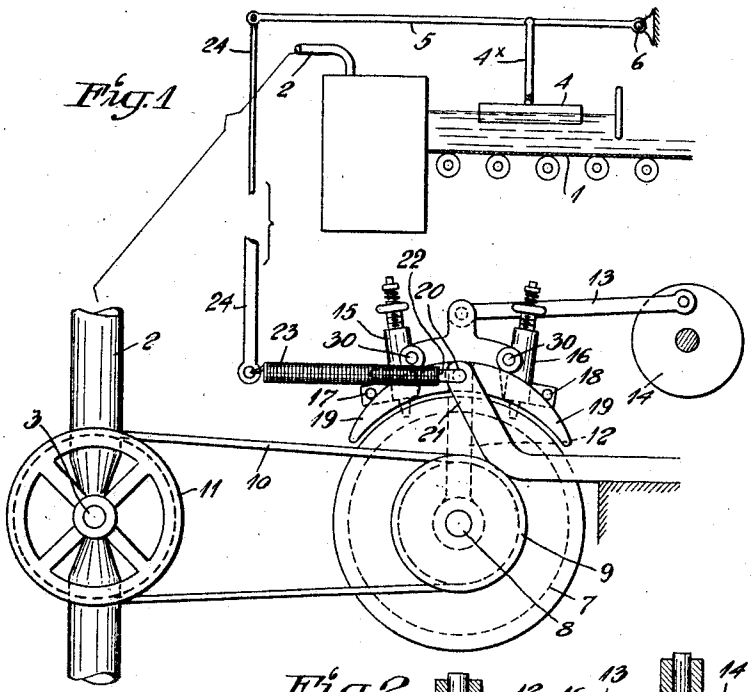


Fig. 2

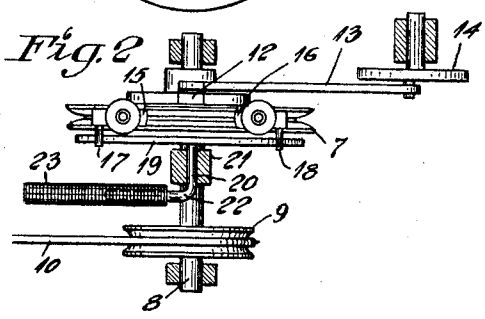


Fig. 3

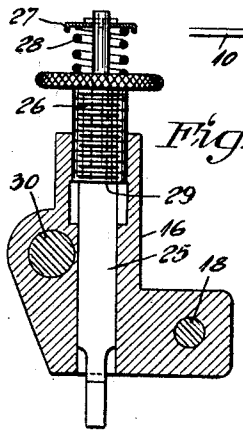
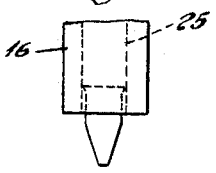


Fig. 4



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UNITED STATES PATENT OFFICE.

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FEEDING DEVICE.

Application filed January 18, 1927, Serial No. 161,932, and in Sweden March 9, 1925.

This invention relates to a feeding device operating with a ratchet gear and adapted to be used chiefly in combination with automatically operating regulating devices. The invention relates more particularly to ratchet gears of that type in which a number of engaging members, for which a controlling device is provided, are mounted on an oscillating carrier common to the same.

According to the invention the said carrier and controlling device are independent of one another and the controlling device so arranged, that the same when occupying a normal position prevents the engaging members from entering into engagement with a motion transmitting member but when shifted to other positions permits some one of the engaging members to enter into engagement with the said motion transmitting member, the direction in which the member last mentioned being moved, being dependent on the engaging member which is operative. The new arrangement of the feeding device involves certain advantages which are of special importance, when the device is used in combination with automatically operating regulating devices.

The invention also comprises certain details, which are explained below in connection with a form of execution, diagrammatically shown in the accompanying drawing and adapted to means automatically controlling the supplying of paper pulp in paper making machines.

Fig. 1 is a side view of the ratchet gearing applied to a paper making machine. Fig. 2 is a plan view of the main parts of the said gearing, and Figs. 3 and 4 show a detail on a greater scale.

1 is a part of a paper making machine, a layer of paper pulp spread on the wire being shown. 2 is the supply pipe for the paper pulp and 3 is a valve controlling the supply of paper pulp. A float 4 rests on the pulp and is by means of a link 4× connected with a lever arm 5 pivoted at 6. A motion transmitting member 7, consisting for instance of a grooved disc, is fixed to or made integral with a rotatable shaft 8. With the said disc 7 or the shaft 8 is suitably connected a rope pulley 9 and around the same and a pulley 11, fixed on the spindle of the valve 3, a rope 10 passes. An arm 12 is swingable on the shaft 8, which by means of a link 13 is connected with a crank disc 14, which imparts to the arm 12 an oscillating movement. Crank disc 14 is rotated continuously and at a predetermined velocity by any suitable source of power. The free end of arm 12 has the shape of a cross. To the arms of the cross two engaging members or pawls 15 and 16 respectively are pivoted. Said members consist of friction pawls which are located right above the groove of the disc 7 and adapted to engage the disc 7, acted upon by gravity, by weights or springs. The turning points of the pawls are located at the same distances from the shaft 8. The engaging members 15 and 16 are provided with projections or pins 17 and 18 respectively, which normally bear against and slide on a guide member 19 fixed to a short shaft 20, journaled in a support 21. Shaft 20 has a crank arm 22, to which a link or a comparatively stiff spring 23 is fixed, the free end of the said spring being fixed to a link 24 pivotally connected with the arm 5.

The described mechanism operates in the following manner. While the supply of paper pulp to the paper making machine is normal, float 4 which in the present case constitutes the impulse member actuating the shifting mechanism, occupies a certain normal position, in which the arm and link system 5, 24 and spring 23 occupy the position shown in Fig. 1 and hold the guide member 19 in a certain normal or medium position, in which it keeps the pins 17 and 18 in such a raised position, that the pawls 15 and 16, which are continuously swung forwards and backwards by the crank disc 14, are prevented from engaging the grooved disc 7. If for some reason for instance an alteration of the pressure in the supply pipe 2 the supply of paper pulp is increased and, consequently, the float 4 is gradually raised, this results in the link 24 being moved upwards and the spring 23 turning the shaft 20 in a yieldable manner, so that the right hand part of the guide member 19 is swung downwards. As pin 18 is then moved to its right most position it is disengaged from the guide member 19, so that pawl 16 can engage disc 7 and turn the same through a certain angle clockwise. This rotary motion is transmitted to the pulley 9 and the pulley 11 of the valve 3, which thus is adjusted for a

reduced supply of paper pulp. If the level of the paper pulp nevertheless still rises, float 4 is raised more and more, which evidently results in the guide member 19 being turned through a further distance, so that pawl 16 during its reciprocating movement remains in engagement with the disc 7 during a longer period and the rotary motion of the said disc is increased per unit of time the more float 4 is moved from its normal position. This results in the reducing of the passage through the valve 3 taking place at an increased rate, counted from the normal position of the valve, which, evidently is of a certain importance.

If on the other hand float 4 sinks to a level below its normal position, owing to the sinking of the level of the paper pulp, the left hand part of the guide member 19 will be swung downwards from the normal position, which results in the pawl 15 engaging the grooved disc 7 and rotating the same counter-clockwise, so that valve 3 is so shifted that the supply is increased.

The shape of the guide ways of the member 19, on which the pins 17 and 18 slide, may, evidently, be modified in many ways and are adapted to the regulating conditions in each case. Generally it might be most practical that the said guide ways have such a shape that the member to be shifted is shifted through a shorter distance per unit of time at a smaller variation of the progress of work than at a greater variation.

In order that the mechanism may operate in a wholly reliable manner, it is suitable that there is a certain degree of elasticity in the motion transmitting device between the float or impulse member and the guide member 19. In the form of execution shown in the drawing the said elasticity is effected by the link 24 being connected with the crank arm 22 by means of a spring.

The said engaging members 15 and 16, preferably, are constructed in a special manner, so that they may easily be adjusted. Figs. 3 and 4 show such an adjustable engaging member consisting of a carrier, in which is slidable a pin 25, the lower end of which is shaped like a chisel or the like and is adapted to engage the groove of the disc 7. The top end of the pin having a shorter diameter is slid into a nut 26 screwed into the carrier. Between the said nut 26 and a washer 27 fixed to the top end of the pin a coil spring 28 is located, which keeps the pin 25 in an upper position, determined by an abutment 29 provided on the pin and bearing against the nut 26, but permits the pin to be adjusted by turning the nut 26, if the pin owing to wear or for any other reason does not engage the disc 7 in a reliable manner. Owing to the described arrangement the pin 25 may easily be removed for the adjusting of its chisel shaped end. The said carriers are pivoted at 30 to the cross arms respectively of the arm 12 and are brought by their own weight into such position that the angle of friction of the pin 25 with the disc 7 is suitable for the purpose.

Owing to the fact that the member, which is to be adjusted (in the present case the valve 3) has been shifted to one of its end positions i. e. is wholly opened or closed, the members of the mechanism may be subjected to damage and for that reason an automatically operating disengaging device of any known construction preferably is provided

In the above specification the feeding mechanism has been described combined with an automatically operating controlling device for paper making machines. The said applying of the feeding mechanism, evidently, is stated only as an example of the practical use of the invention, as the feeding mechanism may be used for a plurality of purposes for instance for the controlling of pulp strainers of different types and generally in adjusting, feeding and motion transmitting devices of different kinds. Feeding mechanisms arranged in accordance with the invention are suitable specially for all such adjusting and motion transmitting devices, in which a continuous parallel motion is to be converted into a rotary motion changed periodically regarding the direction and regarding the duration of the periods. The feeding mechanism may, however, be used for the transmitting of a certain parallel movement to another parallel movement. In the case last mentioned a reciprocating substantially rectilinear motion is imparted to the engaging member, and the said members are adapted to engage a slide or the like.

Further, it may be stated that the invention is not limited to the details described above and shown in the drawing. The details may, evidently, be varied in many ways without exceeding the limits of the invention. As an example may be mentioned that the engaging members 15 and 16 may consist of pawls engaging ratchet wheels, the teeth of which have opposite directions.

I claim:

1. Feeding mechanism comprising a carrier to which oscillating motion is imparted, a number of engaging members provided on the carrier, a motion transmitting member, a guide member independent of said engaging members but adapted, when occupying a certain normal position, to loosely support the engaging members and prevent the same from entering into active engagment relatively to the motion transmitting member and means for shifting the guide member to other positions to permit a desired engaging member entering into active engagement with the motion transmitting

member, the motion direction of the actuated motion transmitting member being dependent on the engaging member which is operative and the action of the latter being increased in a degree directly proportional to the amount of said shifting of the guide member.

2. Feeding device according to claim 1 characterized by the engaging members consisting of friction pawls, which acted upon by their weight tend to engage the motion transmitting member, consisting of a grooved disc.

3. Feeding device according to claim 1, characterized by the operative parts of the engaging members consisting of adjustable and interchangeable pins mounted in turnable carriers.

In testimony whereof I have hereunto affixed my signature.

ERIK SÄLL.