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DIPPING MECHANISM FOR BATTERY GRIDS

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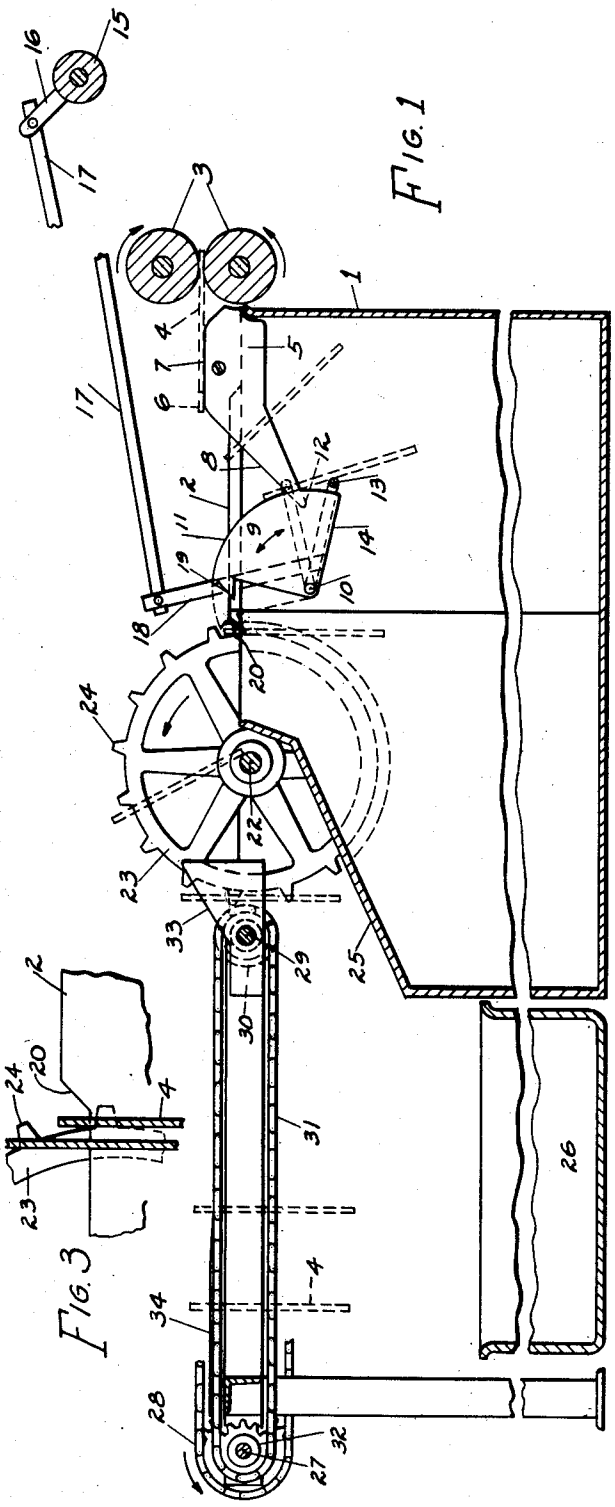


FIG. 1

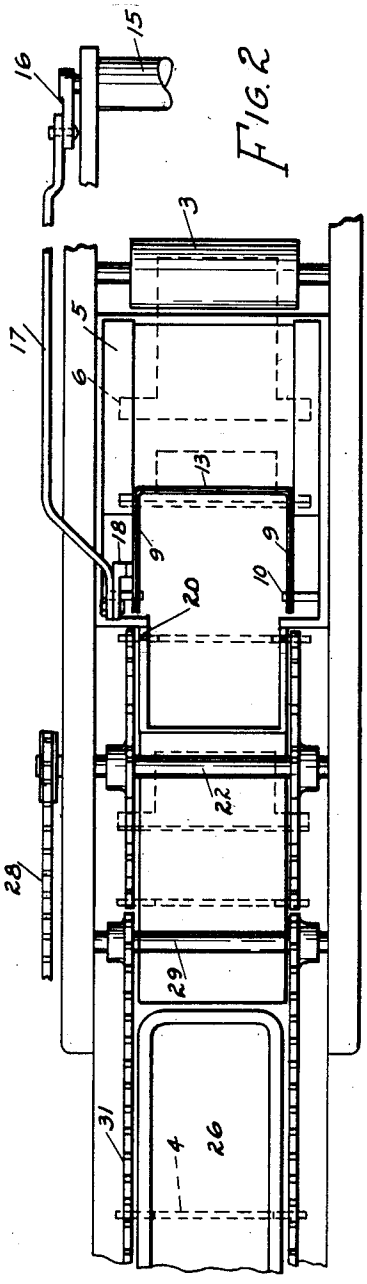


FIG. 2

FIG. 3

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DIPPING MECHANISM FOR BATTERY GRIDS

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Application April 29, 1935, Serial No. 18,772

13 Claims. (Cl. 214—17)

The present invention pertains to a novel dipping mechanism designed particularly for immersing battery grids into a bath of weak acid solution after they have come from the pasting machine. The dipping mechanism is preferably constructed as a continuation of the pasting machine, receiving the grids in a continuous operation from the pasting machine, automatically immersing the grids and delivering them to a conveyor.

The principal objects of the invention, as already indicated, is to perform the dipping operation automatically or mechanically. With this object in view, the member for lifting the grids out of the bath is synchronized with the pasting machine so that the grids are lifted from the bath at the same rate that they are passed through the pasting machine. Thus, skeleton grids are fed into one end of the apparatus and are delivered at the other end, pasted and acid treated.

The invention includes primarily a pair of guides which receive the grids from the final operation in the pasting machine and permit them to slide on their lugs into the acid bath. The lifting member oscillates across the lower end of the guides and is so positioned that it does not permit the grids to drop off their support. The lifting member picks up the grids one at a time and delivers them to a station from which they are carried by a pair of cog wheels to a conveyor. The conveyor, in turn, carries the grids to another station where they accumulate in a suspended condition until taken away by the operator.

The invention is fully disclosed by way of example in the following description and in the accompanying drawing in which

Figure 1 is a longitudinal section of the machine;

Figure 2 is a plan view, and

Figure 3 is a detail of Figure 1.

In Figure 1 is shown a tank *i* above which are a pair of fixed rails **2** spaced apart approximately the width of a twin or double grid. At one end of the tank are a pair of rolls **3** that take the double grid **4** from a pasting machine and project it over the tank **1**. The pasting machine is the subject matter of my co-pending application Serial No. 18,773, filed April 29, 1935.

At this end of the tank, a pair of guides are secured to the rails **2** and are so spaced that the lugs **6** of the double grid may rest upon them while the body of the grid may drop between them. The upper edge of each guide member **5** is initially horizontal as at **7** and positioned to support the grid in a substantially horizontal position as it is ejected by the rollers **3**. The upper edge of each member **5** then slopes downwardly as at **8** so that the grid slides along the edges and into the tank **1** when it is released from the rollers **3**.

Next to the guides **5**, a pair of lifting members **9** of sector shape are pivoted to the sides of the tank **1** on a common transverse center line indicated by the numeral **10**. The area **11** of these members overlap the lower points **12** of the guides for a purpose that will presently appear. The members **9** are attached to one another by a yoke **13** around which they are curled at **14**, so that they operate together as will presently appear. The lifting means may be a pair of eccentric toothed disks or any other suitable mechanism for lifting the grids at proper intervals.

The numeral **15** designates a revolving member embodied in the mechanism for feeding grids to the hopper of the pasting machine. To this member is secured an arm **16** joined by an articulated link **17** to another arm **18** fixed to one of the members **9**. The rotation of the member **15** thus produces an oscillation of the members **9** in synchronism with the rate of feeding. A grid is fed into the hopper with each rotation of the member **15**, so that the members **9** make a complete oscillation for each grid fed into the machine, or delivered from the machine, for a purpose which will presently be described.

When the grids descend the slope **8**, they first are stopped by the arcs **11** of the overlapping members **9** and are thus prevented from falling to the bottom of the tank. When the members **9** reach their bottom position, the grids slide onto the upper edges thereof and are stopped by teeth **19** projecting outwardly from the edges at a short distance from the area. As the members **9** reach their extreme position in the upward movement, the grids slide off the teeth **19** and onto teeth **20** spaced inward from the sides of the tank. These teeth have the same spacing as the guides **5**, that is, they are adapted to suspend the grids by their lugs. The upper edges of these teeth **20** slope downwardly in the direction of the grid travel so that the grid cannot fall off.

At the other end of the tank **1**, the rails **2** support a transverse shaft **22** carrying a pair of similar cog wheels **23**. The cogs **24** are successively carried into the space between the teeth **20** to engage the lower edges of the lugs of grids suspended on the teeth and to raise the grids as shown in dotted lines in Figure 1. In this movement the lower end of the grid drags slightly on the shaft **22** and thereby has its lower end wiped. The end of the tank is formed as a drain board

25 beneath the shaft, and the drippings flow into a tank 26.

The shaft 22 drives a conveyor shaft 27 at the ends of rails 2, by means of a chain 28. The conveyor includes also a counter shaft 29 with spaced wheels 30, and conveyor chains 31 join the wheels to similar wheels 32 on shaft 27. Downwardly sloping guides 33 secured to the rails 2 overlap both the wheels 23 and 30 and thereby transport the grids from the wheels 23 to the conveyor chain 31, the grid lugs lying on the chains.

At the other end of the conveyor are inclined rests 34 that slope upwardly in the direction of travel and cross the level of the top of the conveyor. Thus, the grids are transferred from the conveyor to the rests, and the accumulation of grids packs them together on the rests so that a considerable number may accumulate before being taken away by the operator to another station. While travelling on the conveyor and hanging from the rests, the grids drain into the tank 26.

The direct connection of the lifting member 9 to the feed roll 15 causes these two parts to operate in synchronism. The lifting member makes one complete oscillation for each feeding movement of the member 15. The grids are discharged by the rolls 3 onto the members 5 at the same rate that the grids are fed into the machine, and consequently the timing of the lifting member 5 is such as to raise the grids one at a time after they descend the slope 8.

Although a specific embodiment of the invention has been illustrated and described, it will be understood that various alterations in the details of construction may be made without departing from the scope of the invention, as indicated by the appended claims.

What I claim is:

1. A dipping mechanism for battery grids comprising a tank, guides for delivering grids to said tank and from which said grids are adapted to hang by their lugs, a lifting member adapted to raise said grids by their lugs, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor.

2. A dipping mechanism for battery grids comprising a tank, guides for delivering grids to said tank and from which said grids are adapted to hang by their lugs, a lifting member adapted to raise said grids by their lugs, a conveyor, a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor, and a shaft joining said wheels, the suspended length of said grids being slightly greater than the radius of said wheels, whereby the lower edge of each grid is wiped on said shaft.

3. A dipping machine for battery grids comprising a tank, guides for delivering grids to said tank and from which said grids are adapted to hang by their lugs, a lifting member adapted to raise said grids by their lugs, fixed rests adapted to receive the grids from said lifting member, a conveyor, and a pair of cog wheels between said rests and said conveyor for lifting said grids by their lugs from said rests and delivering them to said conveyor.

4. A dipping machine for battery grids comprising a tank, guides for delivering grids to said tank and from which said grids are adapted to hang by their lugs, means for delivering grids to said guides, a lifting member adapted to raise said grids by their lugs, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor, said lifting member being synchronized with said delivering means.

5. A dipping mechanism for battery grids comprising a tank, guides sloping downward towards said tank and from which said grids are adapted to hang by their lugs, a lifting member overlapping the lower ends of said guides, said member being adapted to raise said grids by their lugs, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor.

6. A dipping mechanism for battery grids comprising a tank, guides sloping downward towards said tank and from which said grids are adapted to hang by their lugs, a lifting member having curved edges overlapping the lower ends of said guides, said member being adapted to raise said grids by their lugs, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor.

7. A dipping mechanism for battery grids comprising a tank, guides sloping downward towards said tank and from which said grids are adapted to hang by their lugs, a lifting member overlapping the lower ends of said guides, said member being adapted to raise said grids by their lugs, fixed rests adapted to receive the grids from said lifting member, a conveyor, and a pair of cog wheels between said rests and said conveyor for lifting said grids by their lugs from said rests and delivering them to said conveyor.

8. A dipping mechanism for battery grids comprising a tank, guides sloping downward towards said tank and from which said grids are adapted to hang by their lugs, means for delivering grids to said guides, a lifting member overlapping the lower ends of said guides, said member being adapted to raise said grids by their lugs, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor, said lifting member being synchronized with said delivering means.

9. A dipping mechanism for battery grids comprising a tank, guides sloping downward toward said tank and from which said grids are adapted to hang by their lugs, a lifting member having curved edges overlapping the lower ends of said guides, said member being adapted to raise said grids by their lugs, fixed rests adapted to receive the grids from said lifting member, a conveyor, and a pair of cog wheels between said rests and said conveyor for lifting said grids by their lugs from said rests and delivering them to said conveyor.

10. A dipping mechanism for battery grids comprising a tank, guides sloping downward towards said tank and from which said grids are adapted to hang by their lugs, means for delivering grids to said guides, a lifting member having curved edges overlapping the lower ends of said guides, a conveyor, and a pair of cog wheels between said lifting member and conveyor for lifting said grids by their lugs and delivering them to said conveyor, said lifting member being synchronized with said delivering means.

11. A dipping mechanism for battery grids comprising a tank, opposed guides for delivering grids into said tank and from which said grids are adapted to hang by their lugs, lifting means having opposed like elements spaced apart un-

obstructedly the width of a grid or the distance between its lugs, whereby said elements are adapted to raise and suspend said grids by their lugs, and conveying means adapted to receive said grids from said lifting means.

12. A dipping machine for battery grids comprising a tank, opposed means for delivering grids into said tank and from which said grids are adapted to hang by their lugs, opposed cog wheels spaced apart unobstructedly the width of a grid or the distance between its lugs, whereby said wheels are adapted to raise said grids from said means and suspend them by their lugs, and conveying means adapted to receive said grids from said cog wheels.

13. A dipping mechanism for battery grids comprising a tank, opposed guides for delivering grids into said tank and from which said grids are adapted to hang by their lugs, opposed cog wheels spaced apart unobstructedly the width of a grid or the distance between its lugs, whereby said wheels are adapted to raise said grids from said tank and suspend them by their lugs, and conveying means adapted to receive said grids from said cog wheels.

JOSEPH CHERNOF.