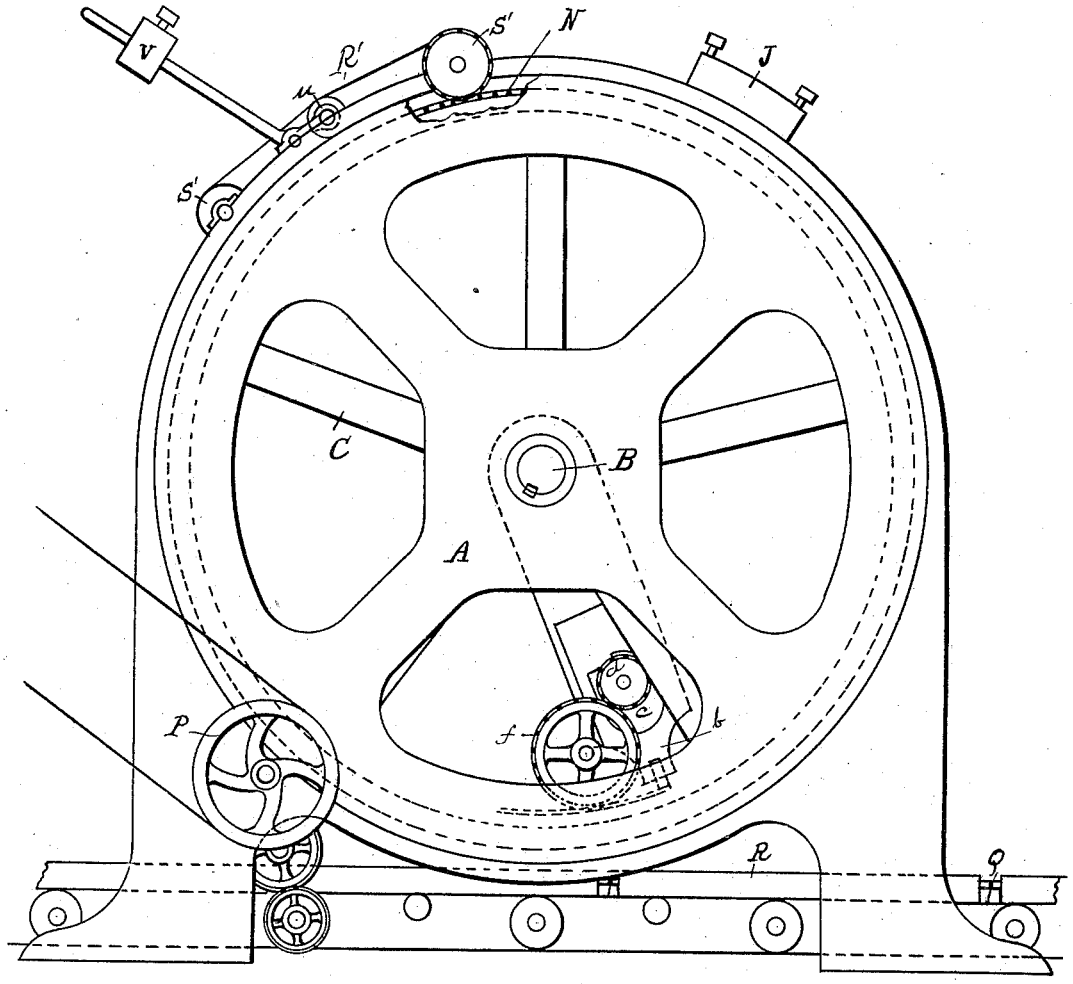
(No Model.) 3 Sheets—Sheet 1.

C. H. FUCHS.

MACHINE FOR THE MANUFACTURE OF CHALK, CRAYON, &c.

No. 383,174. Patented May 22, 1888.

Fig. 1



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Att'y.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

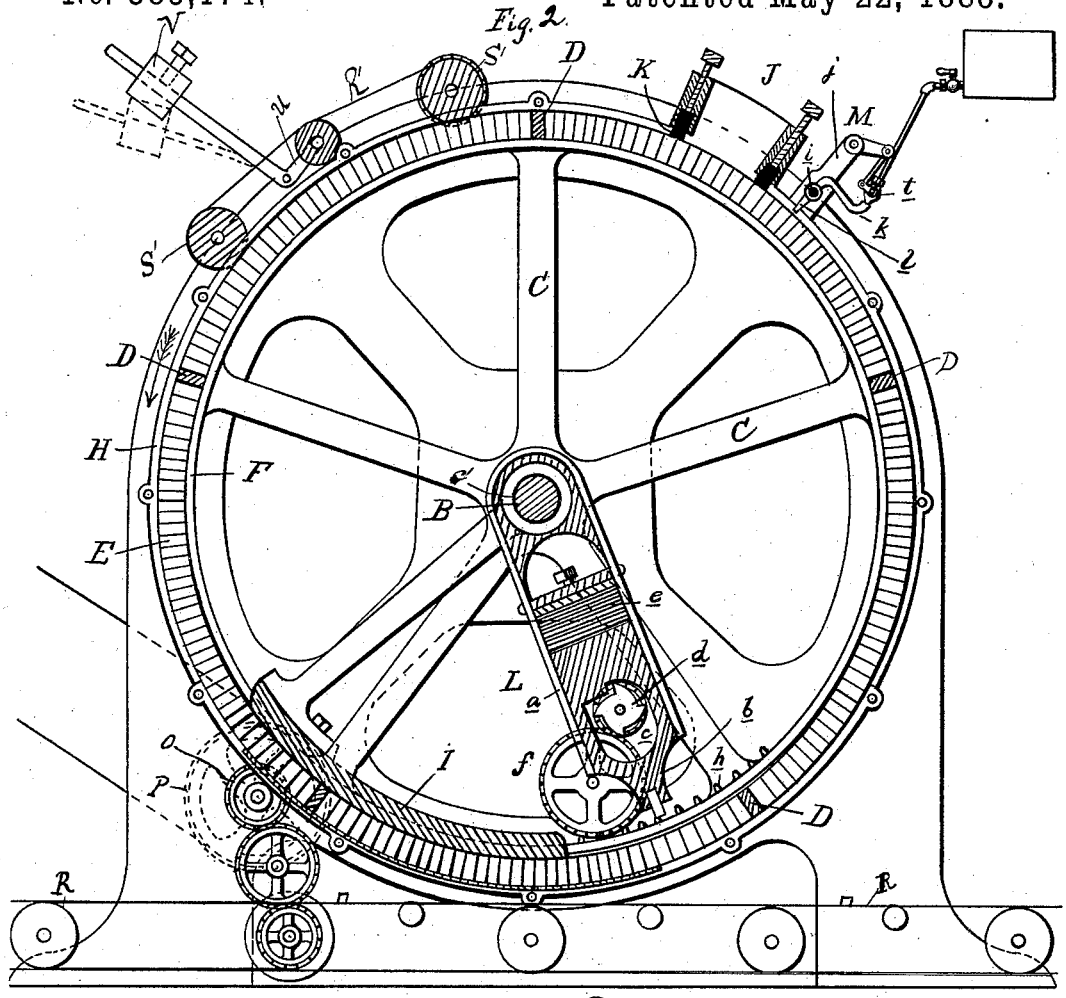
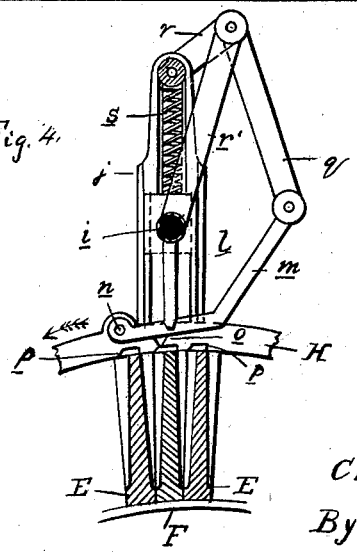


Fig. 4.



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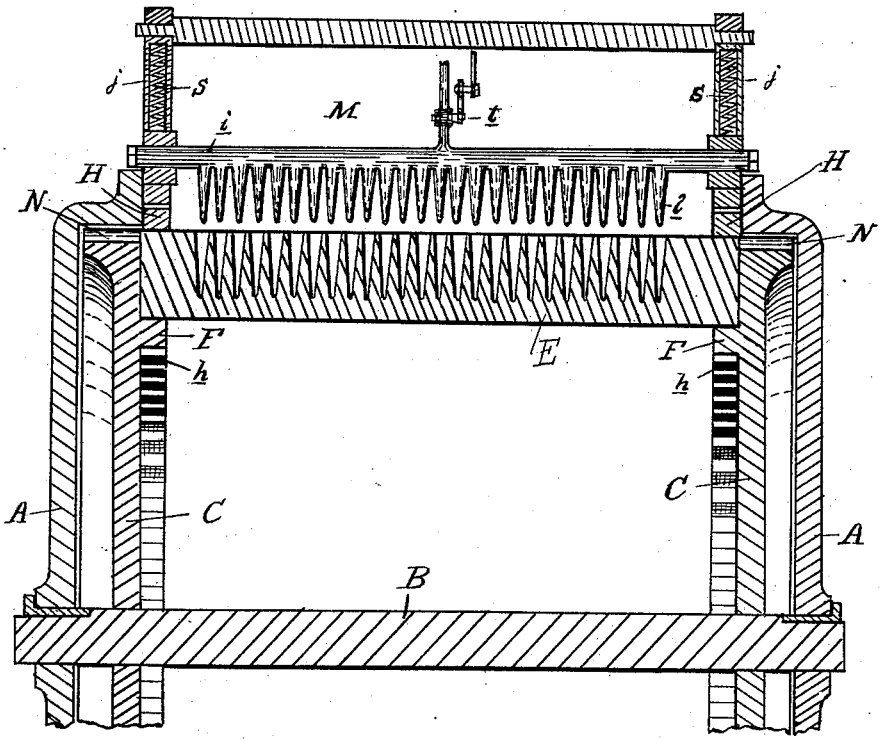
(No Model.) 3 Sheets—Sheet 3.

C. H. FUCHS.

MACHINE FOR THE MANUFACTURE OF CHALK, CRAYON, &c.

No. 383,174. Patented May 22, 1888.

Fig. 3



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UNITED STATES PATENT OFFICE.

CHARLES H. FUCHS, OF SANDUSKY, OHIO.

MACHINE FOR THE MANUFACTURE OF CHALK, CRAYONS, &c.

SPECIFICATION forming part of Letters Patent No. 383,174, dated May 22, 1888.

Application filed October 11, 1887. Serial No. 252,086. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. FUCHS, a citizen of the United States, residing at Sandusky, in the county of Erie and State of Ohio, have invented certain new and useful Improvements in Machines for the Manufacture of Chalk, Crayons, &c., of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in machines for manufacturing crayons, such as school-crayons, carpenter's chalk, &c.

The object of my invention is to so construct a machine of this kind that it will operate perfectly automatic; and to this end my machine consists of a rotary cylindrical bed, on which the molds are permanently placed in position, and of a stationary hopper which receives the paste, and from which it is filled into the molds as they pass underneath at each revolution of the bed; further, in the peculiar arrangement whereby the drying of the crayons is secured; further, in providing means for spreading open the mold sufficiently to loosen the crayons after they are hardened; further, in constructing devices for knocking the crayons out of the molds; further, in collecting the crayons thus discharged from the machine into movable trays, into which they may be run from the drying-chambers; further, in means for oiling the molds, and, further, in preventing the paste from being spilled during the revolutions of the bed, these devices being all constructed to work automatically, rendering the manufacture of the crayons thereby perfectly continuous through all the stages required to prepare them for the market.

To this end my invention consists of the construction, arrangement, and combination of the different parts hereinafter described.

In the drawings which accompany this specification, Figure 1 is an end view of my machine. Fig. 2 is a cross-section thereof. Fig. 3 is a vertical longitudinal section thereof, and Fig. 4 is a detached cross-section of the oiling device on a more enlarged scale.

A are the end frames of the machine, which support the operating parts thereof, and these two end frames are connected together by a shaft, B, keyed or otherwise fastened to each of these end frames.

C C are two circular disks journaled upon the shaft B, and these two disks are connected together by longitudinal bars D to form a single wheel, which will be hereinafter referred to as the mold-drum. Upon the inner face of each of the disks C are secured or integrally formed therewith the concentric flanges F, upon which the sectional molds E are supported. These molds are of the usual description, made in halves, except that they are wedge-shaped so as to adapt themselves to the circular arrangement upon the mold-drum, and the bars D are preferably so placed as to divide the whole number of molds into equal sections.

H are guide-rails adjustably secured upon the inner face of the frames A, and these guide-rails are designed to hold the molds in position upon the concentric flanges F, except where otherwise provided for. Such provision is made at the lower end of the machine, where the guide-rail is slightly eccentric, so that the molds may be pushed radially outward by means of the inner sectional guide-rails, I, which are secured upon the shaft B, the object of such arrangement being to thereby open the joints between the individual molds to loosen the crayons, as more fully hereinafter described.

J is a hopper stationarily secured above and preferably near the top of the mold-drum, and extending the entire length of the molds. This hopper is charged with the paste previously prepared in suitable condition for molding, and as the molds are passed in the rotation of the wheels underneath that hopper the paste is thus filled into the molds, and to prevent any waste or spilling the lower edges of the hopper fit closely against the face of the molds, and where required suitable packing, K, is used to form a tight joint. In the drawings I show this packing adjustably secured by means of set-screws, so that its wear may be compensated for by turning up the screws.

At the lower side of the machine I arrange upon the interior of the mold-drum a hammer or knocker, L, arranged to deliver continuous blows against the inner face of the molds to cause the crayons to drop out of the molds after having been previously loosened therein by the devices before described. This knocker

L is arranged at a slight angle, for the purpose hereinafter described.

The construction of the knocker, as shown in the drawings, is as follows: *a* is a guide-frame secured upon the shaft B. On the lower end of this guide-frame is slidingly secured the ram or piston *b*, which has an interior recess, *c*, in which is journaled the revolving cam *d*. At the inner end of the ram or piston is arranged a suitable spring, *e*. The cam *d* is revolved by means of the cog-wheel *f*, the motion of which is derived from the mold-drum by means of a suitable cog-gear, *h*, formed upon the inner face of the concentric flange F. The motion thus derived revolves the cam *d*, which in turn reciprocates the piston or ram *b*, the spring *e* causing a quick outward motion which violently hammers or jars the molds in their successive passage below the hammer. To increase or diminish the force of the jarring, the spring *e* is made adjustable in any suitable manner.

It will be noticed that the guide-rail H has arrived at its greatest eccentricity at or near the place where the hammer strikes, and from there it returns again to its former concentricity, so as to return the molds back to their old relative position, in which the joints between the molds are all closed. Before the molds are carried back again under the hopper they are made to pass under the oiling device M, by means of which a little oil is introduced into each mold to lubricate them sufficiently to reduce the adhesiveness of the crayons in the mold. This oiling device consists of a radially-movable cross-head, *i*, which is slidingly secured in standards *j*, secured to the frames of the machine. This cross-head is preferably hollow and communicates with an oil-tank by means of a delivery-pipe, *k*. To the under side of the cross-head is secured a series of lubricating-pins, *l*, which correspond with a row of molds, and are made hollow, and from which the oil is discharged at the lower end through a few small holes formed therein. This cross-head is reciprocatingly actuated by means of the devices shown in Fig. 4, and wherein *m* is a lever, pivotally secured at *n* to the frame, and which on its under side is provided with the projection *o*, adapted to come into contact with the projection *p*, formed upon each mold. The free end of the lever *m* pivotally connects with the link *q*, and this pivotally connects with the links *r r'*, the former one of which turns on a stationary pivot and the latter one of which carries the cross-head *i*. The cross-head *i* is acted on by suitable springs, *s*, all so arranged that as the projection *p* of each mold passes underneath the lever *j* the latter is raised up, and by means of the connections described the cross-head, which carries the lubricating-pins, performs a quick downward movement on account of the tension of the springs *s*, or its own weight, which movement inserts the series of oiling-pins into the row of molds with which it corresponds, while simultaneous therewith a little spray of oil or a few drops are injected against the walls of the molds, so as to cause the oil to trickle down along the walls and lubricate the whole inner face. Simultaneously with the movement of the cross-head a suitable connection of said cross head opens and closes a valve, *t*, in the oil-delivery pipe, so as to cut off the supply of oil when not wanted, the oil below the valve being held by the atmospheric pressure from being discharged. Motion is communicated to the mold-drum in any suitable manner, preferably by means of the cogs N, formed upon the periphery of the disks C and drive-pinions O, meshing therewith. The shaft of these drive-pinions is suitably journaled in the frame of the machine and provided with a suitable pulley, P, to which motion is communicated from any suitable source of power.

Underneath the machine I arrange a train of trays, Q, carried by means of the endless belt R, all so arranged that the train moves sufficiently fast to keep the trays moving at a proper rate of speed to cause the crayons to drop therein in regular order and at the angle at which they are discharged, so that the least breakage is caused and, further, the regularity of such discharge facilitating at the same time the drying and subsequent handling of the crayons. The motion for carrying these trays at the required speed I preferably derive from the machine, there being a suitable gearing (not shown) to one of the drive-rolls of the endless belt. The length of the trays I make, preferably, equal to the length of the segments of the molds on the drum.

In practice the mold-drum is revolved by a continuous motion in the direction shown by the arrow, and as the molds are first carried underneath the hopper, they are filled with the paste and carried over the top and then to the lower side of the machine. During this passage the paste is given ample time to set, so that by the time the spreading of the molds begins the crayons are hard, or nearly so. In this condition they are then carried in proximity to the hammer, the jarring of which causes them to drop out of the mold and fall into the trays at a slight angle, which breaks the force of the impact. To prevent the crayons from falling out before the tray is ready to receive them, I secure an apron below the drum. In their subsequent transit the molds are then closed up again to their normal position and carried under the oiling device, and after being lubricated in the manner described they are carried back underneath the hopper, where the molds receive the new charge. Thus the action of the machine is a perfectly continuous one, and perfectly automatic, requiring no further attention than the filling of the hopper. When carpenters' chalks are manufactured, I use in addition a device as shown on the left hand near the top of the machine. This device consists simply of the endless belt R', which is carried over the rolls S', and

the lower run of which belt is made to close the open ends of the molds as they pass underneath. A little tightener-pulley, *u*, is suitably secured to keep the belt tight by means of the weight *v*, arranged as shown. The object of this arrangement is to prevent the paste from being spilled over the top of the molds before becoming sufficiently hardened. With ordinary crayons this is not required, but with carpenter-crayons, where the molds have a wide open top, and the paste is also in a more liquid condition, this device comes in use.

I am not aware that a machine embodying the principle of such continuous and automatic operation as mine has ever been constructed heretofore, and I therefore claim particularly the different elements by means of which this result is accomplished.

I do not intend to claim all the features shown and described as necessary elements in one machine. For instance, the spreading of the molds to loosen the chalks is only necessary when the chalks are made of the form of school-crayons, which are hard to get out of the molds. With carpenter-crayons and other similar compact form the crayons can be removed without spreading the molds, and therefore the molds may be stationarily secured upon the drum. The drum is of relatively large diameter—say six to eight feet—and the motion is relatively slow—say one revolution in six minutes, (more or less,) as required for setting. The placing of the hopper to one side of the center of the drum is merely for the purpose of increasing the time for the setting of the liquid paste. To replenish the material in the hopper, the mixing apparatus may be placed in proximity above the hopper to conveniently discharge from it into the hopper. If desired, the molds may be provided with ribs or grooves upon their ends to engage with corresponding grooves or ribs on the drum, to radially guide the molds when they are expanded.

What I claim as my invention is—

1. In a machine for molding crayons, the combination of a rotary drum, molds forming the cylindrical face thereof, a stationary hopper arranged to form a tight joint with the face of the drum, and a knocker to jar or hammer the molds, all arranged substantially as described.

2. In a machine for molding crayons, the combination, with the rotary mold-drum, of a stationary hopper extending the length of the molds, and of adjustable packing secured to the lower edges of said hopper to form a tight joint with the face of mold drum, substantially as described.

3. In a machine for molding crayons, the combination, with the mold-drum, of a stationary hopper supported above said drum and to one side of the vertical center thereof, and arranged to discharge to one side of said vertical center, substantially as and for the purpose described.

4. In a machine for molding crayons, a rotary mold-drum consisting of a stationary shaft, circular heads journaled upon said shaft, circular flanges upon the inner face of said heads, longitudinal division-plates secured to said heads and dividing the face of the drum into sections, and wedge shaped molds supported between the division-strips on the circular flanges of the heads, all arranged substantially as described.

5. In a machine for molding crayons, in combination, the rotary mold-drum provided with circular shoulders or flanges on the inner face of the heads on which the molds are loosely supported, a supporting-frame in which said drum is journaled, and guide-rails secured to the stationary frame to retain the molds upon the mold-drum, substantially as described.

6. In a machine for molding crayons, the combination, with the rotary mold-drum carrying sectional molds, of eccentric guide-rails controlling the radial adjustment of said molds on the mold drum, substantially as described.

7. In a machine for molding crayons, the combination of a rotary mold-drum, a stationary shaft on which said drum is journaled, a supporting-frame, sectional molds carried by the mold-drum, circular shoulders or flanges on the heads of the drum to support the molds on the under side, stationary guide-rails arranged to radially confine the molds upon the outside, eccentric portions in said rails to permit the radial outward movement of the molds, and a stationary segmental inner guide-rail to compel such radial movement, substantially as described.

8. In a machine for molding crayons embodying in its construction a rotary mold-drum, a stationary hopper extending the length of the face thereof and forming a tight joint therewith, an automatically-operating knocker for jarring the molds to remove the crayons, trays to receive the crayons and automatically carry them from the machine, and a lubricator for the molds, all substantially as described.

9. A machine for molding crayons embodying in its construction a rotary mold-drum, sectionally-constructed wedge-shaped molds carried by said drum, an expander for radially expanding the molds on the mold-drum, a hopper arranged on the face of the mold-drum, a knocker to remove the crayons from the mold, an automatically-operating oiler for the molds, and an automatically-moving train of trays to receive the crayons and carry them from the machine, substantially as described.

10. In a machine for molding crayons, the combination, with the rotary mold-drum, of an endless apron arranged to travel over a portion of the face of the mold-drum, with its lower portion run over the molds to close the top of the molds, substantially as described.

11. In a machine for molding crayons, the combination, with the rotary mold-drum, of a radially-reciprocated cross-head carrying a

series of oilers corresponding with the molds, an oil-supply tank, a pipe leading from said tank to the oilers, a valve in said pipe, and connections, substantially as described, actuated by the motion of the drum to intermittently reciprocate the oilers and open and close the valve, substantially as described.

12. In a machine for molding crayons, the combination of a rotary mold-drum, a stationary shaft on which said mold-drum is journaled, and a knocker secured to said shaft within the drum and actuated by the motion of the drum, substantially as described.

13. In a machine for molding crayons, the combination of a rotary mold-drum, a stationary shaft on which said drum is journaled, and a reciprocating hammer having its supporting-frame secured to the aforesaid shaft, and with the hammer operating in an oblique direction to strike the molds at a point past the lowest point, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 30th day of July, 1887.

CHARLES H. FUCHS.

Witnesses:
OTTO KROMER,
W. F. CONVERSE.