A. C. DOWNING.

PAPER CREASING MACHINE.

APPLICATION FILED OCT. 17, 1908.

1,089,402.

Patented Mar. 10, 1914.

2 SHEETS—SHEET 1.

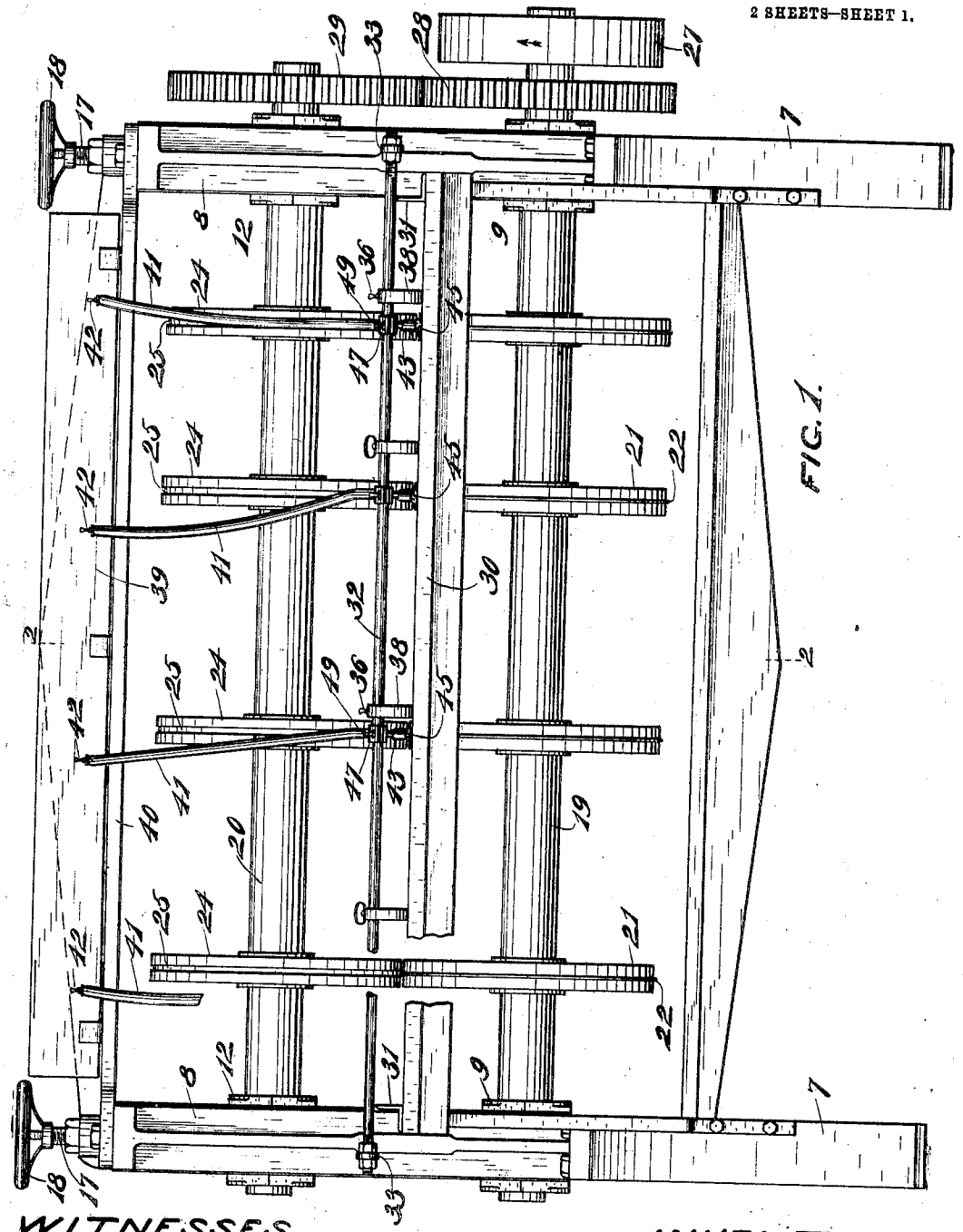


FIG. 1.

WITNESSES.

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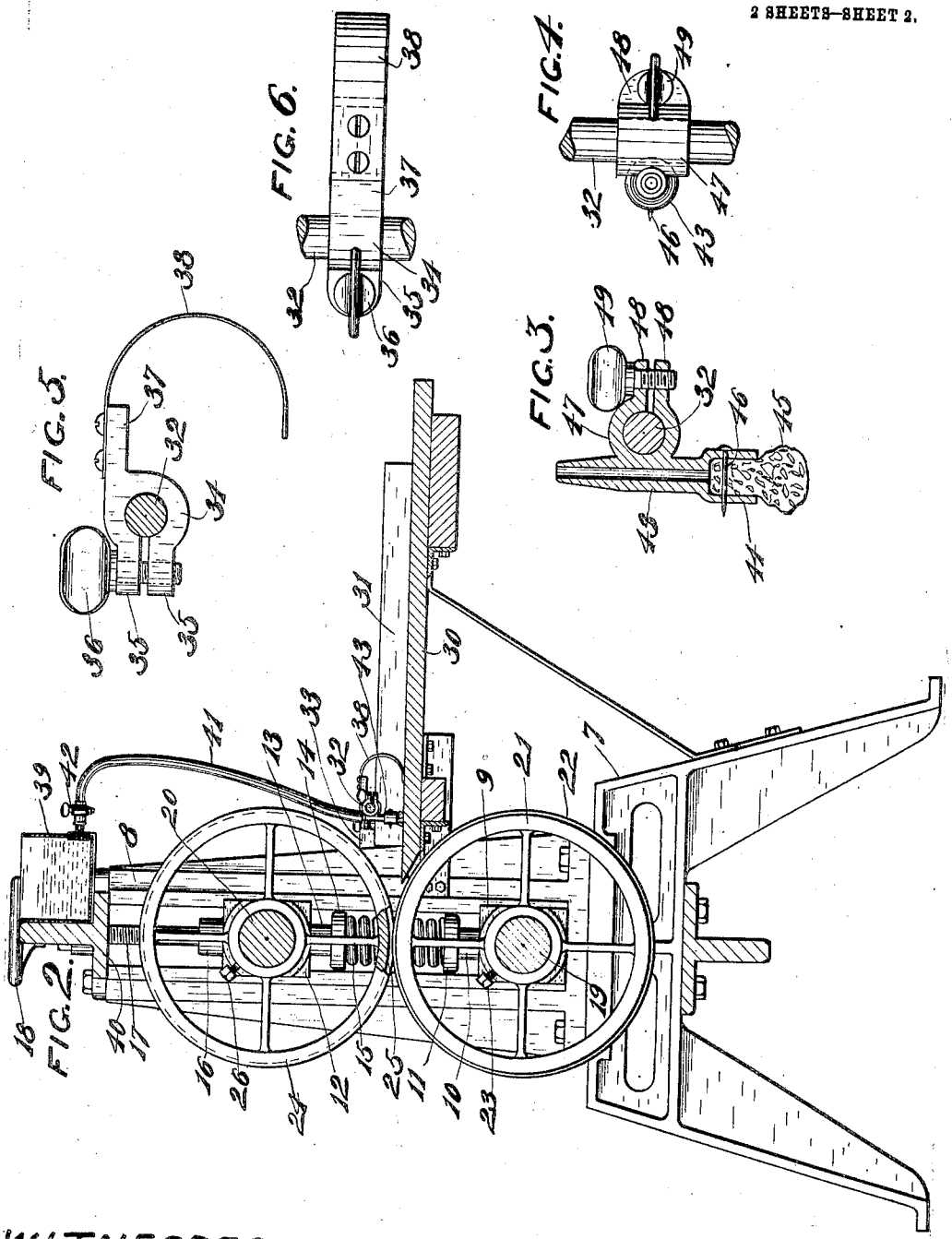
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UNITED STATES PATENT OFFICE.

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PAPER-CREASING MACHINE.

1,089,402. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed October 17, 1906. Serial No. 458,207.

To all whom it may concern:

Be it known that I, ALBERT C. DOWNING, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Paper-Creasing Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in paper creasing machines.

In the creasing of paper or cardboard through the medium of paper creasing machinery, it is frequently the case that the cardboard is of such thickness that the rotary creasing device is incapable of making a crease of sufficient depth to enable the cardboard to be readily folded along the crease line.

It is therefore the primary object of my invention to provide improved mechanism in connection with creasing machines which will obviate the above pointed out difficulty by automatically moistening or dampening the cardboard in advance of the action of the creasing mechanism on the cardboard, the line of wetting or moistening being along a line corresponding to the creased line desired to be made.

With the above primary object, and other incidental objects, in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a front elevation of a rotary creasing machine equipped with my improvements, parts being broken away; Fig. 2 is a transverse section on the line 2—2 of Fig. 1; Fig. 3 is a vertical section through the nozzle of the moistening device; Fig. 4 is a plan view of Fig. 3; Fig. 5 is a view of the mechanism for holding the paper or cardboard to the table; and Fig. 6 is a plan view of Fig. 5.

Referring to the machine in connection with which my improvements are employed, the numeral 7 indicates the lower portion of the frame, which is in the form of a supporting table having slotted standards 8, 8 extending upwardly from opposite ends thereof. Within the lower ends of the slots of the standards, and seated in the bottom of said slots, are bearings 9, 9. The bearings 9 are provided with upwardly extending bosses 10, each boss being formed at its upper end with a cup shaped enlargement 11. Above the bearings 9 are other bearings 12, 12 movable in and guided by the slots of the standards 8. Depending from the under sides of these bearings are bosses 13, the lower end of each boss being provided with a cupped enlargement 14. Two stiff coiled springs 15 are provided, and the lower end of each of said springs is seated in the lower cupped enlargement 11, and the upper end of each spring is seated in one of the upper cupped enlargements 14. From the upper side of each upper bearing 12 extends a boss 16. Passing through a threaded opening formed in the upper closed end of each slotted standard 8 is a screw 17. The upper ends of the screws are provided with hand wheels 18, for convenience in turning, and the lower ends of the screws are adapted to contact with, or to be brought into contact with, the upper ends of the bosses 16.

Journaled in the lower bearings 9, 9 is a lower shaft 19 and journaled in the upper bearings 12, 12 is an upper shaft 20. Mounted on the lower shaft are a series of wheels 21, each wheel having a creasing rib 22 peripherally therearound. These wheels are adjustably mounted on shaft 19 by means of set screws 23 passing through the hubs of said wheels and engaging the shaft. Mounted on the upper shaft 20, and adapted to coöperate with the wheels 21, are other wheels 24, each having a groove 25 extending peripherally therearound. The wheels 24 are also adjustable by means of set screws 26 extending through the hubs thereof and engaging the shaft. Wheels 21 and 24 are similarly set on their respective shafts, so that in the rotation of the wheels the ribs 22 of wheels 21 will register with and engage the grooves 25 of wheels 24. It is usual to employ four wheels on each shaft, and I therefore show this particular number in the accompanying drawings.

By the employment of the specific form of bearings for the shafts 19 and 20, and the specific mechanism in connection therewith, hereinbefore described, the shafts may be made to approach or recede from each other, in order to cause the wheels 21 and 24 to be brought into more or less close engagement peripherally. When it is desired that the distance between the wheels be increased, the screws 17 are turned upwardly, and this will have the effect of withdrawing the lower ends of screws 17 from contact with

the bosses 16. The coils of the springs 15, will then immediately expand and force the upper bearings 12 upwardly, and thereby cause a continuation of the contact between the bosses 16 and the ends of the screw rods. The space, therefore, between the peripheries of the creasing wheels is thereby necessarily increased. When it is desired to bring the creasing wheels into closer relation peripherally, the screw rods are turned downwardly. This will have the effect of forcing downwardly the bearings 12 as against the contrary force exerted by the coiled springs, and consequently the upper wheels will thereby be brought closer to the lower wheels.

On the outer end of the lower shaft 19 is mounted a belt wheel 27, around which a belt (not shown) leading from any suitable source of power is adapted to be passed. The rotation of the lower shaft 19 is conveyed to the upper shaft 20 through the medium of a toothed wheel 28 mounted on shaft 19 and meshing with a similar wheel 29 mounted on shaft 20.

Extending forwardly from the machine, and suitably supported, is a table 30 upon which the cardboard or paper to be creased is laid. This table is disposed on such a plane that the paper or cardboard placed thereon, will, when forced toward the creasing wheels, pass between the peripheries of said wheels. On each side of the table are guide strips 31, 31.

Just above the rear end of the table, and slightly in advance of the rollers, is a transverse rod 32, the ends of said rod being supported in suitable supports 33, 33 projecting forwardly from the uprights 8. On this rod are adjustably mounted paper pressing devices, specifically shown in Figs. 5 and 6 of the drawings. Each of these devices consists of a split collar 34, having tongues 35, 35 extending from the split. The rod 32 passes through the opening of each collar, and said collar is held at adjusted position on the rod by means of a clamping screw 36 turned through the tongues 35. Projecting forwardly from each collar is a short arm 37, and to this arm is connected one end of a curved spring pressure finger 38. This spring finger is curved forwardly, with the lower or terminal end thereof extending rearwardly and resting on the table so as to exert a yielding pressure on the paper or cardboard.

The machine as thus far explained is a well known type of rotary creasing machine, and a description and illustration thereof have been given, so that the application of my invention thereto and its combination therewith will be readily understood.

Referring now particularly to the improvements, it will be seen that I provide an upper water tank 39, which is supported on a beam 40, said beam connecting the upper ends of the slotted uprights 8. Communicating with this water tank are a series of flexible tubes 41, the number of said tubes corresponding to the number of the pairs or sets of creasing wheels employed. Each tube is equipped with a cock 42 located preferably at the upper end of the tube and near the side of the water tank. The lower end of each tube fits over the upper end of a nozzle 43. The lower end of each nozzle is enlarged to form a chamber 44 with which the lower end of the bore of the nozzle communicates. Into this chamber is inserted the upper end of a sponge 45, said sponge being held in the chamber by any desirable means, as, for instance, by means of a transverse pin or small nail 46. The front side of each nozzle, at approximately a central point thereof, is provided with a split collar 47, said collar having an opening through which the rod 32 passes. The clamp is split, and provided with fingers 48, 48 extending from the split. These fingers are brought together to effect a clamping or forced apart to unclamp, by means of clamping screws 49.

In the operation of my invention, the paper or cardboard is placed on the table 30, and pushed along said paper beneath the pressure fingers 38 and beneath the sponge of the moistening device, the advancing edge of the paper being brought into the space between the peripheries of the creasing rollers. The machine is now set in motion, the belt wheel being rotated in the direction of the arrow, Fig. 1. Through the intermeshing gears 28 and 29, the two shafts 19 and 20, and consequently the creasing wheels carried thereby are rotated in opposite directions. The paper or cardboard is of course, by reason of the rotation of the creaser wheels pulled between the peripheries thereof, and the ribs 22 will indent the paper or cardboard, and make a continuous crease line therealong. Previous to the making of the crease line, however, the sponges, which rest on the paper or cardboard, moisten the paper along a line corresponding to the line to be creased.

In creasing machines it is frequently necessary to change the distance of the creased lines apart. This of course renders it essential that the creasing wheels or creasing mechanism be adjustable laterally with respect to each other. It is for this reason that the set screws 23 and 26 are provided which pass through the hubs of the creasing wheels and enable this adjustment to be effected. Of course when the creasing wheels are adjusted, it is necessary that the moistening or dampening mechanism be likewise adjusted, to correspond to the changed position of the creasing wheels. It is for this reason that I provide the clamp 47 in connection

with the nozzles 43, and by loosening the set screws 49 the said clamp and nozzle may be readily moved along the rod 32 to the desired position, and when such position is reached the clamping screws are again tightened. The clamps in connection with the pressure fingers also permit the said fingers to be adjusted.

What I claim as my invention is:

In a paper creasing machine, the combination of a frame, alined shafts mounted in bearings in said frame, creasing wheels mounted on one of said shafts, means for adjusting the wheels laterally upon the shaft, coöperating creasing wheels mounted on the other of said shafts, means for adjusting the said wheels laterally on their shaft, the provision for the lateral adjustment of the two sets of creasing wheels permitting of the regulation of the distance apart of the creased lines, moistening devices located forward of and in line with the creasing wheels, and on a plane, or substantially a plane, with the point of meeting of the peripheries of said wheels, said moistening devices adapted to form, previous to the action of the creasing wheels on the material, a plurality of moistened or dampened lines, upon which lines the creasing wheels subsequently act, and said moistening devices carrying at their lower ends a sponge or other foraminous material, and having a duct leading to the sponge, and also provided with a horizontally projecting clamping means, a transverse rod which the clamping means of the moistening devices adjustably engage, a water reservoir supported on the frame at an elevation to the moistening devices, and flexible tubes leading from the reservoir to the moistening devices and registering with the ducts of said moistening devices.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALBERT C. DOWNING.

Witnesses:
E. J. HAASCH,
A. K. WEST.