June 16, 1925. 1,541,831

O. LINDER

PROCESS OF MAKING MOLDED ARTICLES

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Fig. 1.

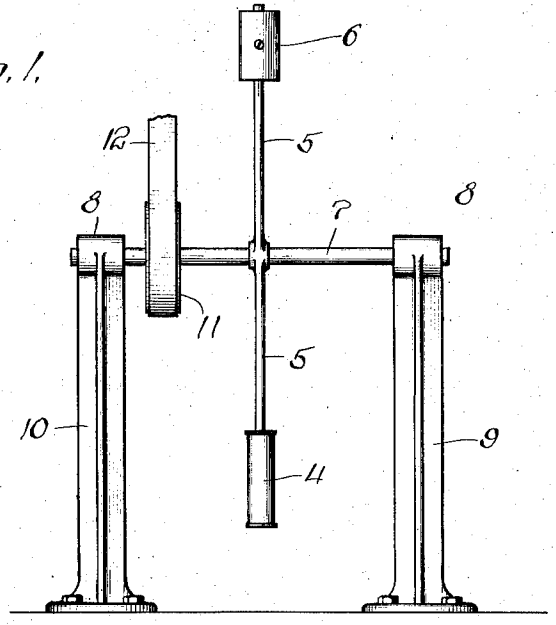
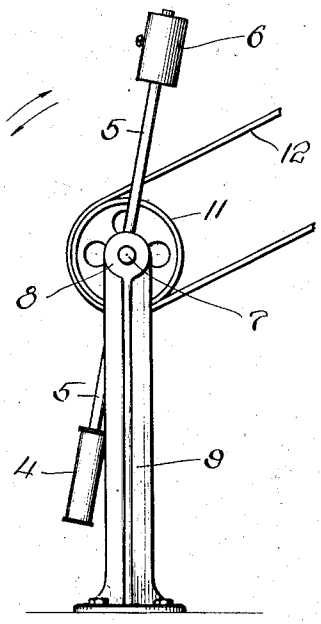



Fig. 2.




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# UNITED STATES PATENT OFFICE.

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## PROCESS OF MAKING MOLDED ARTICLES.

Application filed November 5, 1921. Serial No. 512,989.

*To all whom it may concern:*

Be it known that I, OSCAR LINDER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Processes of Making Molded Articles, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

This invention relates to an improved process of making molded articles in which liquids, semi-liquids or pastes are converted into solid form under pressure, and more particularly to the process in which such liquids, semi-liquids or pastes are converted into solid form under pressure with the exclusion of gas or air cells.

The process herein described is more particularly applicable to the molding of printers' and lithographers' rollers from the materials commonly used therefor, such as glue-glycerine composition or vulcanized oil. The object of the invention consists primarily in the production of an improved process by which air and gas cells will be excluded from the roller material while this material is still in a liquid form, and in the ultimate formation of a compact uniform mass under pressure which will be free from sponginess and from substantially all air and gas cells.

The improved process herein described may be practiced in any form of apparatus in which the mold containing the material to be formed and hardened is subject to a centrifugal action. In the accompanying drawings a simplified schematic apparatus is illustrated in which—

Figure 1 is a front elevation of said apparatus; and,

Fig. 2 is an end elevation thereof.

As illustrated in the drawings, the mold 4 is preferably mounted at the end of a bar 5, the other end of said bar carrying a counterweight 6. If desired, instead of using the counterweight 6, another mold such as 4 could be attached to the other end of said bar 5. The bar 5 is rigidly positioned in any desirable way on a shaft 7, which shaft is mounted in the bearings 8, the bearings being supported on suitable uprights 9 and 10. The shaft 7, together with the bar 5 secured thereto, may be rotated in any convenient manner, as, for example, by the pulley 11 and the associated belt 12. The belt 12, obviously, may be driven in any suitable manner. Instead of mounting a single bar to carry the mold 4 on the shaft 7, evidently a plurality of such bars could be utilized on which any desired number of molds could be positioned. Likewise, it will be evident that any other means could be employed for centrifugally rotating the molds.

In the apparatus illustrated and described when the mold 4 is filled with the material which is to be molded into desired form, as, for example, a melted glue-glycerine roller composition, the shaft 7 can be rotated and this will subject the mold 4 at the end of the rod 5 to a centrifugal action. By suitably arranging the speed of rotation of the shaft 7 and by placing the mold 4 at a desired distance from the shaft 7, any practical, desirable centrifugal force can be obtained and applied to the material contained in the mold 4 during solidification or molding.

In the practice of this improved process the material in the mold and the mold proper are subjected to a centrifugal force, the center of rotation of which is outside of the mold. In this manner the gas and air cells in the liquid contained in the mold will all be driven from said mold and from said liquid at the end of the mold closest to the center of rotation by the centrifugal force to which the mold is subjected. By thus subjecting the material from which the molds are made to a centrifugal action, the center of which is outside of the mold, all of the gas and air cells will be driven from said material; whereas, if the material of the mold were subjected to a centrifugal force, the center of which was inside of the mold, the gas and air cells would collect at said center and the heavier material from which the mold is constructed would be driven to the outer ends of the mold.

If the mold to be formed is a glue-glycerine roller, the material from which said roller is made will solidify allowing it to cool to room temperature during centrifugation. When printers' rollers are to be constructed, according to this invention, the

composition used to construct the roller is immaterial. The roller composition or material before molding is preferably in a liquid condition. The degree of liquidity and temperature of the material are of no importance so long as the material before its solidification can be readily poured or conveyed.

In the construction of glue-glycerine rollers, according to this invention, the glue-glycerine composition is melted first by the application of heat, after which it is poured or forced while still hot and liquid through a suitable pipe or tube into the desired mold. This glue-glycerine composition is rather viscous and contains a large number of air or gas cells, some of which are quite large, but most of which are quite minute. The large air cells in the construction of a roller of this character frequently rise to the surface and burst. The small or minute gas or air cells are very apt to remain suspended in the liquid and the resulting composition after cooling and solidification will be somewhat spongy unless the materal is subjected to the centrifugation, as herein described. When the material is rotated in the mold 4, as herein before described, the small or minute air or gas cells will substantially all be expelled from the mold, due to the action of the centrifugal force which will separate these light gas and air cells from the liquid and force the gas and air cells from that end of the mold which is closest to the center of the rotation.

If the rollers are made of vulcanized oil a similar condition exists. The oil, usually vegetable oil, which is to be vulcanized, is mixed with sulphur-chloride and the mixture is then forced or poured into the mold where a chemical reaction between the oil and the sulphur-chloride takes place, due to which action there is a resulting solidification of the mass. When the mold is made of vulcanized oil, as just described, air and gas cells are suspended in the mixture, but in addition thereto gas is likewise formed during the reaction, which results in a further formation of gas cells and a further tendency towards sponginess of the resulting molded article, in case the roller during solidification is not subjected to centrifugation. However, when the roller is made according to the teachings of this invention, these gas and air cells are expelled from the resulting hardened roller.

In both of the above cited typical examples for the construction of molded material from liquids, semi-liquids or pastes, the application of centrifugal force results, as has been described, in a separation of the air and gas from the material of which the mold is constructed. In each case the air and gas is expelled from the liquid in a direction toward the axis of rotation, while the much heavier liquid at the same time and due to the same centrifugal force is subjected to a pressure in the mold. Hence, the act of subjecting the mold to a centrifugal force results in the beneficial expulsion of the gas and air cells and in the beneficial application of pressure to the liquid from which the molded article is being constructed within the mold.

Obviously, the invention is not restricted to the specific materials and articles hereinbefore cited in the preferred embodiment of the invention, but is applicable to any liquid, semi-liquid or paste, whether hot or cold, which can be solidified or molded or to any substance which can be passed through any of these consistencies before or during said centrifugation or molding. Likewise, it is immaterial how this soldification takes place, whether through cooling, heating, chemical reaction, vulcanization or any other means. Other materials which might be subjected to this improved process, in addition to the ones hereinbefore mentioned, are waxes, soaps, glue, bakelite, rubber, rubber compounds, metals, etc.

The speed of centrifugation required in this improved process depends upon the pressure desired in the mold; the length of time required for solidification; the viscosity of the material applied before solidification and the size and the number of air and gas cells in said material. In subjecting the material to the centrifugation, it is immaterial for the purposes of this invention in what direction the centrifugal force is applied in relation to the mold. The invention can be applied to any kind of mold regardless of its shape or size, and said mold can be either cooled or heated during said centrifugation.

It will be evident that the preferred forms of the invention described herein are capable of wide application and elaboration and that consequently the invention is not limited to the specific form herein described, the scope of the invention being limited merely by the claims hereto appended.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The process of molding resilient printers' or lithographers' roller under pressure which consists in obtaining the pressure to which the material to be molded is to be subjected by submitting the roller to a centrifugal force, the center of which is outside of the mold in which the roller to be molded is contained.

2. The process of molding resilient printers' or lithographers' roller under pressure and simultaneously eliminating air and gas cells from the material from which the roller are to be molded while in the liquid or semi-liquid form, which consists in subject-

ing the resilient roller while in this form and during the molding process to a centrifugal force, the center of which is outside of the mold.

3. The process of molding solid resilient printers' or lithographers' rollers from liquids which consists in subjecting the liquid roller material to a centrifugal force during solidification, the center of said centrifugal force being outside of the said roller.

In witness whereof, I have hereunto subscribed my name.

OSCAR LINDER.