Feb. 2, 1932. H. A. W. WOOD 1,843,471

PRECISION PLATE COOLING DEVICE

Original Filed June 3, 1926 2 Sheets-Sheet 1

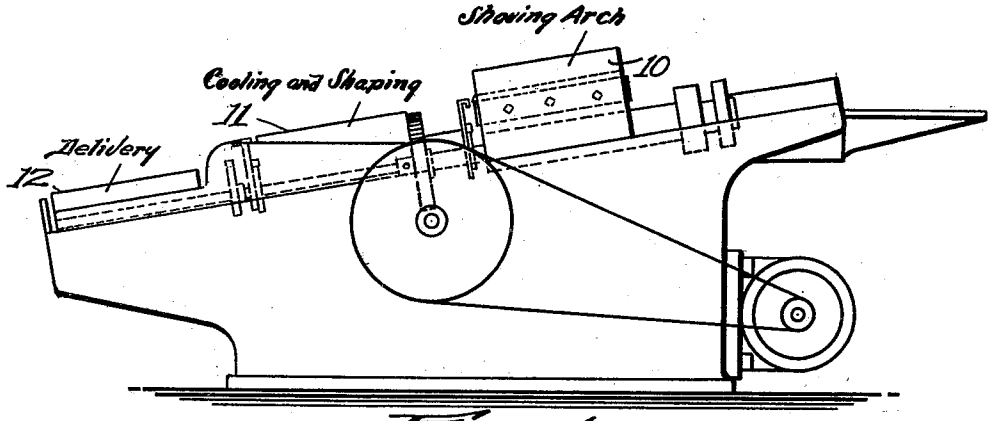


Fig. 1.

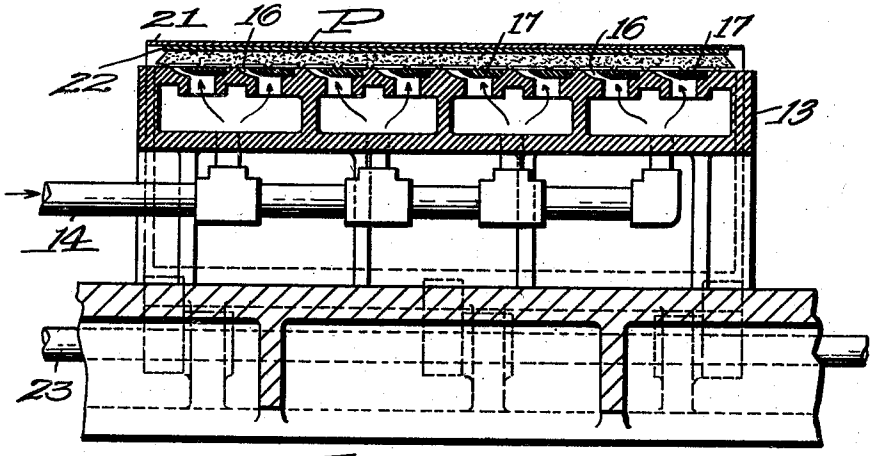


Fig. 4

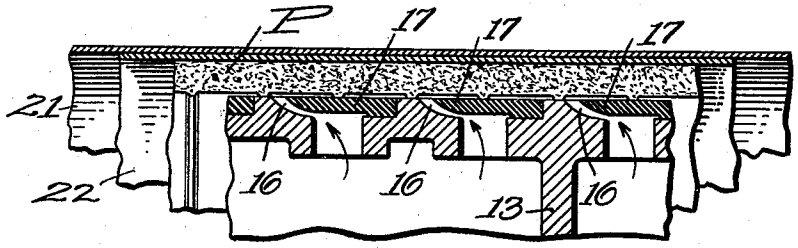


Fig. 5.

Inventor
Henry A. Wise Wood
By Attorneys
Southgate Fay & Eberly

Witness
E. F. Kirsch

Feb. 2, 1932. H. A. W. WOOD 1,843,471

PRECISION PLATE COOLING DEVICE

Original Filed June 3, 1926 2 Sheets-Sheet 2

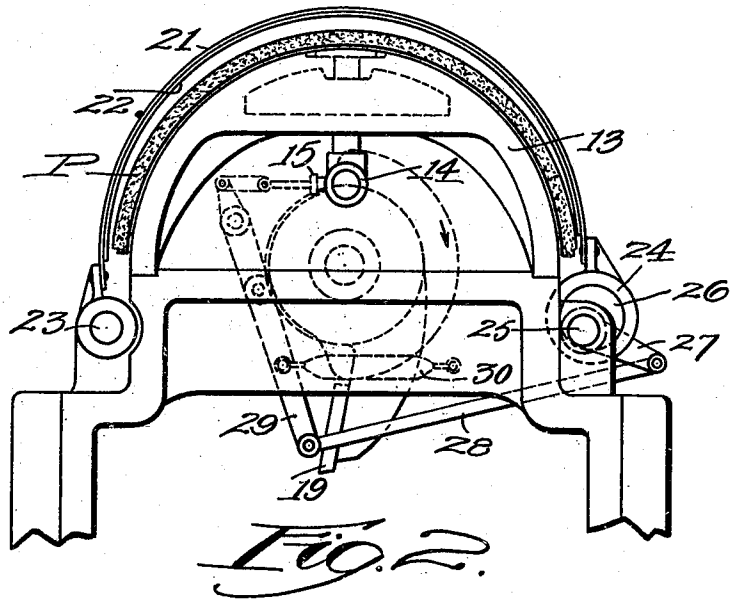


Fig. 2.

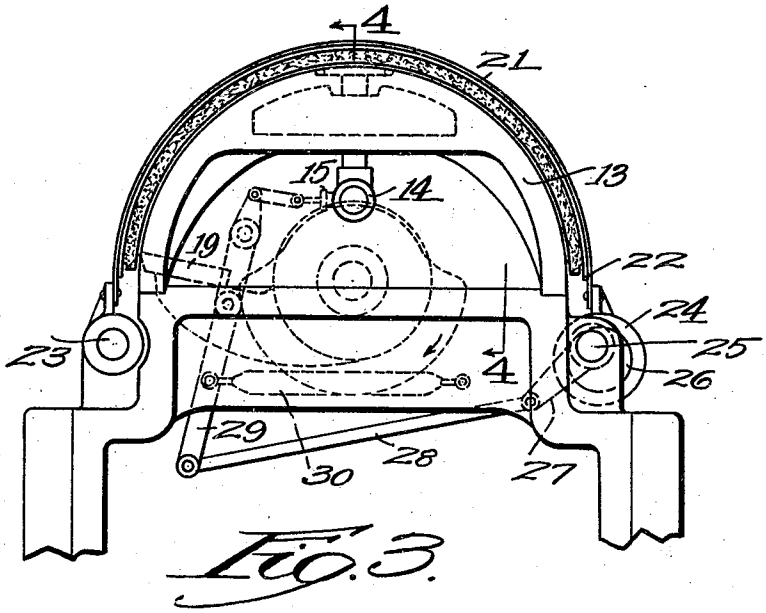


Fig. 3.

Inventor
Henry A. Wise Wood
By attorneys
Southgate Fay + Hawley

Witness
C. F. Wesson

Patented Feb. 2, 1932 1,843,471

UNITED STATES PATENT OFFICE

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO WOOD NEWSPAPER MACHINERY CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF VIRGINIA

PRECISION PLATE COOLING DEVICE

Application filed June 3, 1926, Serial No. 113,543. Renewed June 29, 1931.

This invention relates to a device for cooling stereotype printing plates.

The principal object of the invention is to provide means by which the warping of the plates during cooling is prevented, so that they are discharged from the cooling device in correct and uniform shape; also to combine the means for holding the plates against warping with the means for introducing the cooling fluid so that they will come into action together.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a side view of a gravity shaving and cooling machine for stereotype plates to which this invention is shown as applied;

Fig. 2 is an end view on enlarged scale of the cooling arch showing the parts in the position they assume before a plate is ready to be cooled;

Fig. 3 is a similar view showing the position of the parts during the cooling operation;

Fig. 4 is a longitudinal sectional view showing the details of the cooling means; and

Fig. 5 is a similar view on enlarged scale showing these parts more in detail.

New cast stereotype printing plates are likely to warp and loose their correct shape when cooled by the application of water to their surfaces. This is due to the contraction of the metal and especially to the fact that the cross section of the plates at different points is different. The control of this contraction and warping by any such means as applying cooling water in any particular way has so far proved impossible.

According to this invention I provide means for positively preventing plates from getting out of shape or warping during the cooling operation. This ensures a perfect curvature for the plate as delivered. When the plate is once cooled it will not change its shape because there are no internal strains to cause it to warp.

I have shown the invention as applied to a well-known type of shaving and cooling machine in which the shaving arch 10 is located along an incline, and the plates are delivered therefrom to a cooling arch 11 in a straight line and to the delivery platform 12. It is to be understood, however, that this invention can be applied to practically any type of machine in which the stereotype plate is cooled by water or the like. It is, of course, especially applicable to the cooling of curved stereotype plates, but the principle is applicable to stereotype plates of any other shape and in fact to soft castings in general.

The cooling arch illustrated is of the general semi-cylindrical form with a convex cooling saddle 13 into which cooling water is introduced through a pipe 14 controlled by a valve 15. The water is discharged through ports 16 around water deflectors 17. These deflectors extend to one side or the other from the inlets to the water ports 16 to distribute the water along the inside of the plate. Obviously, as the water cannot be distributed equally to every minute part of the interior surface of the plate, it is convenient to distribute it in streams so that it will enter between the ribs of the plate which has already been shaved off by the rotary shaver 19 in the arch 10. This constitutes a nearly uniform distribution of the water and theoretically should provide for cooling the plate equally all the way from end to end and also around its semi-circular interior surface. But the distribution cannot be made sufficiently even to avoid the warping which has been described. Furthermore, the tendency of the plate is for its straight edges to move bodily during cooling, no matter how the water is applied.

For the purpose of preventing the distortion of the plate during cooling, I provide a semi-circular clamp 21 which preferably is composed of a sheet-steel plate. As this is designed to come into contact with the type surface of the plate, and as it is desired to have it press equally on the plate all around, it is lined with a surface 22 of soft substance, such as felt or the like. This plate is pivoted on a rod 23 along one side of the cooling arch, and is connected with the opposite side of the cooling arch by two or more hinge connec-

tions 24 secured to the edge of the clamping plate 21.

Along the edge of the arch extends a shaft 25 which is usually employed on these machines for operating the valve 15 as will appear. This shaft is provided with eccentrics 26 along its length which operate the hinges 24. When the shaft 25 is in the position shown in Fig. 2, the plate 21 is raised by the eccentric construction so as to leave a space between the arch 13 and the clamping plate 21 into which the plate P can slide down the usual inclined guides indicated in Fig. 1. At the same time the valve 15 is closed. Now after the plate enters the arch, as shown in Fig. 2, the shaft 25 is operated either by hand or mechanically, but preferably from the cam shaft with which shavers of this kind are provided. It is turned from the position shown in Fig. 2 to that shown in Fig. 3. This has the effect of drawing the steel plate 21 down tight against the printing plate so as to clamp it firmly to the cooling saddle.

The saddle, of course, is finished to the correct radius so that the printing plate, with its ribs previously shaved to a correct surface, will rest thereon in a true semi-cylindrical condition. The plate is firmly clamped between these two surfaces and held at all points by two opposite surfaces which practically engage it. Therefore the cooling of the plate by the turning on of the water cannot get it out of its true semi-cylindrical shape.

The water is turned on when the shaft 25 is turned as above described by means of an arm 27 on the shaft 25, and a system of links 28—29. A spring 30 is employed to pull the valve closed and move the clamping plate 21 up in conjunction with the eccentric 26, thus, the spring always tends to hold these parts in inoperative position.

When the plate has been cooled, the clamps are opened and the water shut off at the same time by turning the shaft 25. The plate is permitted to run down the inclined pathway on the delivery platform 12. It will be understood, of course, that the usual means are employed for stopping the plate in the cooling arch in the proper position for cooling and releasing it, but no such means is shown herein.

In this way it will be seen that the plate gets no chance to warp during the cooling operation, and that as it is delivered from the cooling arch in a perfectly cooled condition it cannot warp or shrink afterwards. In this way instead of correcting the difficulty by reshaping the plate after it has got into a misshaped condition, the plate is always kept in accurate shape, and never allowed to go through the warping process ordinarily encountered. Furthermore, the water is distributed as evenly as possible over the back of the plate and runs in the passages between the ribs in compact streams, that is, it is not allowed to splash, and air cannot get into it, so that the cooling is as uniform as possible.

Although I have illustrated and described only one form of the invention, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is:—

1. In a cooling device for stereotype printing plates, the combination with a stationary cooling saddle having the proper shape for fitting the interior of a plate and holding the plate thereon by the action of gravity, with means for engaging the exterior of the plate and holding it in contact with the saddle and preventing distortion of the plate during the cooling operation and means for directing streams of cooling liquid through said saddle into contact with the inside of the plate.

2. In a cooling arch for curved stereotype printing plates, the combination with a semi-cylindrical cooling saddle having the proper shape for supporting the interior surfaces of the shaved ribs of the plate in a semicircular condition, the saddle having passages for directing a cooling liquid against the concave surface of the printing plate, with means for engaging the exterior of the plate and holding it firmly in contact with the saddle and preventing distortion of the plate throughout the cooling operation and means for directing cooling liquid against the interior of the plate at a plurality of points between the ribs.

3. In a cooling device for a stereotype printing plate, the combination with a hollow cooling saddle, and means for discharging water from the interior of the saddle on the inside of the printing plate thereon, of a flexible curved plate located outside the saddle and printing plate, and means for drawing said curved plate down on the surface of the printing plate to keep the latter from changing its shape during the cooling thereof.

4. In a cooling device for a stereotype printing plate, the combination with a cooling saddle, and means for discharging water from the saddle on the inside of the printing plate thereon, of a plate located outside the saddle and printing plate and having a soft lining for engaging the printing surface of the plate, and means for forcing the outside plate into contact with the surface of the printing plate to keep the plate from warping.

5. In a cooling device for a curved stereotype printing plate, the combination with a cooling saddle for supporting the plate, of a bodily movable plate adapted to surround the printing plate, and means for drawing the opposite edges of the steel plate down to bring the whole into firm contact with the printing plate throughout the area of the latter to pre-

vent the warping of the stereotype plate during cooling.

6. In a cooling device for a curved stereotype printing plate, the combination with a cooling saddle for supporting the plate, of a plate adapted to surround and cover the entire convex surface of the printing plate, said steel plate being pivotally mounted along one edge of the saddle, and an eccentric device at the other edge for closing it to apply pressure to the entire surface of the printing plate.

7. In a cooling device for a stereotype printing plate, the combination with a cooling saddle, and means for discharging water from the saddle on the inside of the printing plate thereon, of a curved plate located outside the saddle and printing plate, and means for drawing the curved plate against the surface of the printing plate to keep it from changing its shape during the cooling thereof, said means comprising a shaft along the side of the saddle adapted to be turned and having means whereby the turning of the shaft will bring the free edge of the outer plate into clamping position.

8. In a cooling device for a curved stereotype printing plate, the combination with a cooling saddle, and means for discharging water from the saddle on the inside of the printing plate thereon, of a curved plate located outside the saddle and printing plate and pivoted along one side of the saddle, a shaft along the other side adapted to be turned, and eccentrics on the shaft connected with the free edge of said curved plate whereby the turning of the shaft will bring down the free edge of the outer plate into clamping position.

9. In a cooling device for stereotype printing plates, the combination with a cooling saddle having the proper shape for holding the interior of a plate having its ribs properly shaved and resting on the saddle, with means for engaging the exterior of the plate and holding it firmly in contact with the saddle throughout the cooling operation, said means being pivoted along one edge of the arch, a shaft on the other edge having means for bringing that edge of said means down into clamping position, and means connected with said shaft for simultaneously turning water on in the arch.

10. In a cooling device for stereotype printing plates, the combination with a cooling saddle for holding a stereotype plate, of means for engaging the exterior of the plate and holding it firmly in contact with the saddle throughout the cooling operation, a shaft at the side of the saddle eccentrics on the shaft for bringing said means into clamping position, and means connected with said shaft for simultaneously turning water on in the arch.

11. In a cooling arch for a stereotype printing plate, the combination of a saddle having a cooling water pipe for directing the water thereto, a valve for controlling the admission of water to said pipe, said saddle having openings therethrough for directing the water against the interior surface of a plate on the saddle, and means for clamping the printing plate firmly down on the surface of the saddle throughout the area of the plate.

12. In a cooling arch for a stereotype printing plate, the combination of a saddle having a cooling water pipe for directing the water thereto, a valve for controlling the admission of water to said pipe, said saddle having openings therethrough, and deflectors for turning the water to one side and causing it to flow evenly along the inner surface of the saddle.

13. In a cooling device for stereotype printing plates, a convex saddle shaped substantially to the interior of the cooling plate, a concave former on the convex side of the plate, means for bringing the convex former into firm relation with the plate for the purpose of shaping it, and means for delivering a cooling medium against the plate for cooling the latter while it is being held firmly between the saddle and the former.

14. In a cooling device for curved stereotype printing plates, the combination of a convex saddle shaped to fit the interior of the plate to be cooled, a concave former, means for bringing the former into firm relation with respect to a plate on the saddle for the purpose of shaping it, and means for flowing a cooling medium through the saddle in streams at a plurality of points against the plate substantially covering the concave surface of the plate to be cooled.

In testimony whereof I have hereunto affixed my signature.

HENRY A. WISE WOOD.