Aug. 13, 1935. R. L. MELTON ET AL 2,011,181

METHOD FOR PREVENTING OFFSET IN PRINTING

Filed Dec. 14, 1932

Fig. 1.

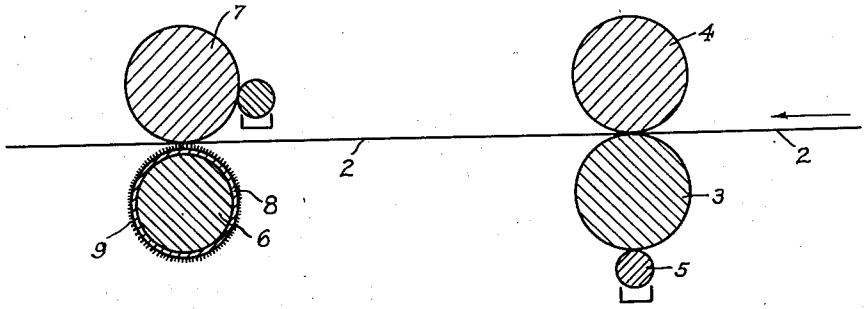


Fig. 2.

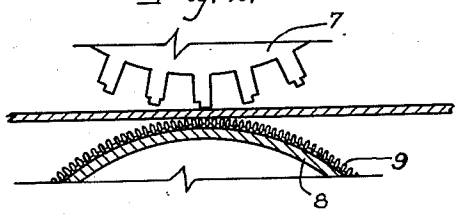


Fig. 3.

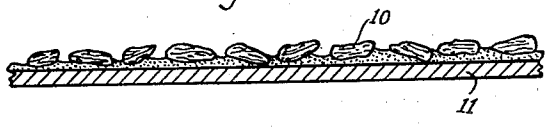
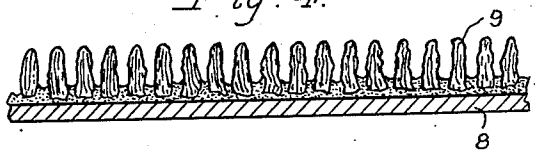


Fig. 4.



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METHOD FOR PREVENTING OFFSET IN PRINTING

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Application December 14, 1932, Serial No. 647,243

1 Claim. (Cl. 101—420)

This invention relates to an improvement in method for printing and particularly relates to the use of fabric having a coating of oriented granules which are adapted to prevent offset in printing.

The problem of preventing offset in printing occurs particularly when it is desired to print sheets on both sides. It is possible of course, after a sheet has been printed on one side to store it until the ink is thoroughly dry and then print on the opposite side of the sheet. This method of printing is not suited to a modern print shop on account of the excessive expenditure of time that it involves. Various means have been devised to dry the ink on the freshly printed side quickly, as for example, etched aluminum surfaces have been used. These etched surfaces are moistened for the purpose of forming an ink "repelling" surface. Printer's ink is oily in its nature and therefore does not mix readily with water. Moreover, the condition of the moistened aluminum surface is likely to vary with time because of the tendency to evaporation which depends again on the temperature and humidity of the air. In the method of printing which has just been described the freshly printed paper passes between a printing roll (for the unprinted side of the paper) and a supporting roll covered with etched metal the surface of which has been moistened.

In still another method of printing, granularly coated paper is used to cover the supporting roll during the second printing process. In this case the side of the paper, which was first printed, passes into contact with the granular coated paper as the sheet passes between the second printing roll and the adjacent supporting roll. It is claimed that the granular coated paper contacts forcibly with the freshly printed side over a comparative small area since the granular particles resist the pressure exerted by opposite printing roll. The granular particles tend to prevent slipping of the freshly printed side and hence tend to reduce smearing or blurring of the first printed side.

In ordinary granularly coated paper however, the grain is distributed in a haphazard manner so that the flat sides of the abrasive grain are found on the rough surface in a large proportion of the granules instead of the sharper points.

The present invention is concerned with the use of elongated grain attached endwise to a backing, and at an angle of 45° to 90° inclusive, with the backing in order that the supporting roll may be covered with a sheet having a serrated coating in which the distribution of points is comparatively regular. The orientation of the granules also permits more ink to gather on the sides of the granules without smearing than would be the case with a supporting surface in which a large proportion of the granules have flat sides on the outer surface of the sheet.

The desired orientation of the granular particles may be secured by means of the apparatus described and claimed in our co-pending application Serial No. 647,241, filed December 14, 1932. As disclosed in this application an oriented granular coating is produced by projecting such granular particles upwardly from a movable carrier onto the underside of a downwardly facing adhesive coated web.

Further specific forms of devices for orienting the particles on granular coated webs are disclosed in our co-pending application, Serial No. 636,982, filed October 10, 1932, in which granular particles are electrostatically oriented and applied to a downwardly facing adhesive coated web. Another form of device which may be employed is that described in our co-pending application, Serial No. 637,016, filed October 10, 1932, in which magnetically susceptible particles are applied to an adhesive coated surface, a desired orientation of the particles being secured by the action of a magnetic field.

The use of oriented grain to prevent offset in printing is illustrated by means of the accompanying drawing in which:

Figure 1 is a sectional elevation of a printing apparatus illustrating a method of printing on both sides in which one of the supporting rolls is shown as covered with oriented grain;

Figure 2 is a fragmentary enlarged sectional view showing the action of the type on the web and showing supporting granules (on the counter roll) which lie adjacent to the portion of the sheet being printed;

Figure 3 is an enlarged section through a sheet having a random coating of granules; and

Figure 4 is a similar enlarged section through a sheet having a coating of oriented granules.

In the process of printing on both sides of paper or other suitable material, a sheet 2 (see Fig. 1) is passed between a printing roll 3 and a counter roll 4, the printing roll being inked by means of an ink roll 5. The sheet then passes along with fresh printing on its lower side until it comes in contact with the granular coated surface of the supporting roll 6. The oppositely disposed printing roll 7 now prints the reverse side (upper side in Fig. 1) of the sheet 2. During this printing process the side of the sheet which

was printed by means of the roll 3 is supported on a large number of points 9 which project from the surface of the fabric 8 which has been wrapped around the roll 6. The points 9 prevent the freshly printed surface on the lower side of the sheet 2 from slipping and therefore tend to prevent the smearing or blurring which is likely to occur where etched metal surfaces or similar means is used to cover the counter roll 6. The oriented grain covering is of such a character as to provide considerable storage space for ink which becomes detached from the freshly printed surface and runs down the sides of the granules 9. The oriented grain surface can therefore be used for a comparatively long time before smearing occurs.

Figure 4 is an enlarged view and shows more clearly the general character of the granular coated web for covering the surface of the counter roll 6. The elongated granules 9 are uniformly spaced and so positioned that their longer dimensions are approximately normal to the web backing 8. Granular coated webs which have the granular particles inclined at angles as small as 45° have however been found to be effective in preventing offset in printing. Such oriented coatings support the freshly printed surface at a large number of points and with a minimum of the surface of the individual granules in contact with the inked surface. Such is not the case with the usual granular coated web illustrated in Figure 3. The granules 10 are haphazardly positioned on the web 11 and with their longest dimensions approximately parallel to the surface of the backing. Consequently a larger surface of each granule makes contact with the freshly inked surface and greatly increases the tendency to smear or blur.

Some of the advantages which are claimed for a granular coating of the type above described for preventing or reducing offset in printing may be summarized as follows:

1. The production of a superior quality of printing is facilitated by reason of the limitation of the contact surface between the freshly printed front surface and the counter roll.

2. The greater ink capacity furnished by a coating of the type described increases the resistance to offsetting. The granularly coated web can thus be used a longer time before it becomes saturated, that is before it becomes in a condition to produce serious offsetting or smearing.

3. The useful life of the coated web is increased because of the arrangement of the grain. This is a particularly valuable feature because of the importance of time in printing such matter as newspapers, for example, where any delay in the printing operation is a very serious disadvantage.

4. A greater weight of sizing coating is possible when the granules are positioned endwise. This increases the strength of adhesion of the granules to the fabric without sacrificing ink capacity as compared with the usual unoriented granular coated web, which is typified by Figure 3.

5. Coated webs made as described above have a granular coating which is one grain thick. The coating is thus attached directly to the backing and is more satisfactory than the ordinary coating which may consist of a jumble of granules piled on top of each other.

6. An oriented granular coating provides a greater number of supporting points per unit area.

Various kinds of granules other than those referred to above may be used, such as granules of crushed quartz, mullite, glass, sillimanite, etc. It is desirable however, that the granules be of an elongated character so that in the resultant product the minimum dimensions of the granules are in general parallel to the supporting fabric. The maximum or larger dimensions of the granudes are therefore in general perpendicular to the plane of the fabric. The material of which the sizing coating is formed may likewise be varied within wide limits so long as it can be sprayed around the granules and is capable of being thereafter hardened to reinforce the granular coating.

We claim:

The method of printing both sides of a sheet which comprises printing on one side of the said sheet, then bringing the said sheet into printing relationship with means to print on the opposite side, and pressing the said sheet against the said printing means by the points of a layer of upstanding elongated particles which are separated from each other by a distance less than their major axes.

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