

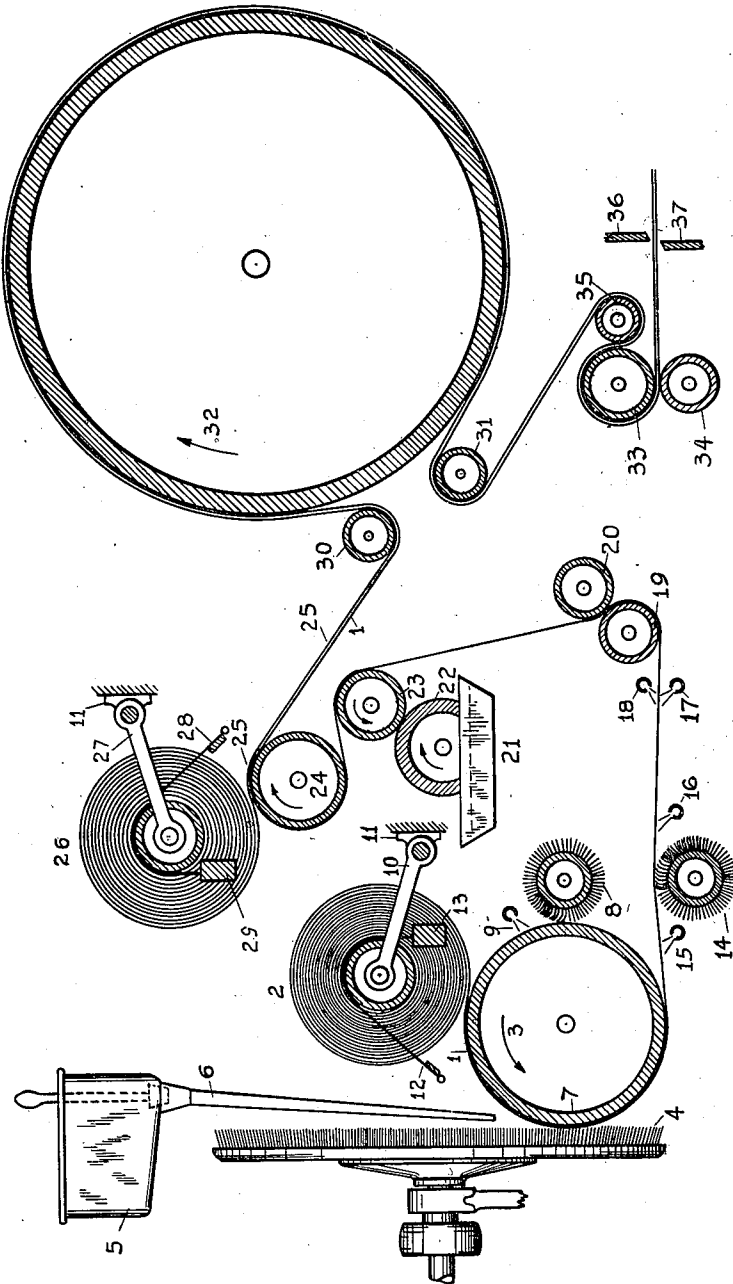
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OFFICE PRINTING SHEET

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OFFICE PRINTING SHEET

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This invention relates to lithographic office printing sheets, and more particularly to a method of roughening metal foil in the manufacture of sheets of this description.

The metallic coating of lithographic office printing sheets should not exceed a few hundredths of a millimetre in thickness, in order not to impair the flexibility of these sheets permitting of their introduction into and preparation in a typewriter.

Since the usual lithographic process necessitates a grained surface of the plate in order to ensure adhesion of the ink and the moistening water, the provision of lithographic printing plates or sheets of the extreme thinness such as required for office purposes with the requisite graining represents a technical problem in itself.

This technical problem is moreover accompanied by a further problem of a purely commercial kind, insofar as the process employed for roughening the sheets must be an extremely economical one, in view of the fact that for a large number of years cheap stencils have been available on the market for use in connection with other office printing processes, in which a roughening of the sheets is not required at all.

With due consideration to these aspects a sand-blasting process, for example, would not enter into the question, as the costs involved in a process of this nature would render the article quite unsaleable.

Treatment of the sheets in jigging machines by means of sand and small balls, in the same manner as large plates, is also wholly impossible in view of the sensitivity of the sheets, which confines a treatment of this kind to a mere laboratory test.

On the other hand a chemical treatment producing a good grain has not been found up to now, whilst the known method of subjecting metal foil to the action of brushes as usual in a rolling mill results in a striped grain, which is wholly inadequate for lithographic printing purposes.

The known method of graining as used in lithographic printing shops, which consists in roughening the surface by means of wet powdered pumice stone, is undoubtedly useful for the treatment of plates, but is wholly unsuited for the graining of sheets. Thus, for example, in view of the extreme sensitiveness of these sheets, a grain of pumice stone which may happen to reach the back of the sheet appears on the surface of the sheet in the form of a bump or elevation.

The invention accordingly has for its object to overcome the difficulties in question, and with this end in view consists in the combination of known graining or roughening means with a novel method of application suitable only in respect of sheets.

This combined method is based substantially on the simultaneous and locally combined action of brushes and wet abrasive powder as for example powdered pumice stone on the sheet material moving past these means.

The apparatus necessary for this treatment is illustrated by way of example in the accompanying drawing.

The sheet material or foil 1 is taken from a supply roll 2, and conducted over a supporting drum 3 rotating in the direction of the arrow. The web of material, which is tensioned on the drum, is subjected in continuous operation to a roughening treatment of the kind known per se by means of a rotary brush having metal bristles.

Experiments have shown that a brush 4 in the form as illustrated is particularly suitable for the treatment of sheets.

The roughening process above referred to is combined in accordance with the invention with a second roughening process as follows: Proceeding from the tank or reservoir 5 a sludge composed of an abrasive powder as for example pumice stone and water is conducted through a feed pipe 6 to the grinding zone 7 between brush and drum. The grain obtained by the combined action of the wire brush or brushes and pumice stone will satisfy in every respect average lithographic requirements.

To make the combined graining process a continuous one additional means are provided in accordance with the invention as follows:

In order to avoid bumps or elevations resulting from grains of pumice stone which may have passed to the back of the sheet material, the drum is freed from all traces of pumice stone by means of a rotary washing brush 8 and by washing with a jet or spray of filtered water 9.

The immediate contact of the supply roll 2 with the drum 3 has the particular object of preventing the formation of folds or creases in the web of material. For this purpose the supply roll 2 is mounted in levers 10, which are pivoted to the wall 11 of the machine. A brake band 12 having a weight 13 causes the material to move in close contact about the drum.

The lithographically grained material after passing the processing zone 7 is freed from all

pumice stone sludge adhering thereto by the rotary brush 14, and any single grains of pumice stone will be expelled by the jets of water 15, 16, 17, and 18.

5 The adhering excess of moisture is removed by wringing rollers 19 and 20.

After this phase of the treatment the sheet material is suitable in itself for use in a lithographic process, assuming the thickness of the material amounts to approximately .1 mm. In 10 the particular form of embodiment shown, however, it is assumed that the sheet material or foil is much thinner, and for use in offices has applied thereto a backing of paper.

15 For this purpose, therefore, the web of foil is conducted to a gluing device 21, 22, 23, 24 of the kind known per se, to be united with a web of paper 25 proceeding from a supply roll 26. In this case the roll 26 also rests in immediate fashion against the drum 24 in order to prevent folds 20 or creases, the roll 26 being mounted in levers 27, which are pivoted to the wall 11. A brake band 28 having a weight 29 ensures proper contact between the paper 25 and the drum 24.

25 The two webs 1 and 25 after being combined are conducted by means of auxiliary rollers 30, 31 over the heated drying drum 32.

A system of driven rollers 33, 34, 35 causes continuous withdrawal of the combined webs, and 30 conducts the latter to knives 36, 37, which sever from the web sheets of the desired size to constitute the finished sheets.

In similar fashion the grained material may also be conducted to other processes of treatment 35 without interruption in the operation, as the graining of the material in the combined process above described takes place much more rapidly than in any other method hitherto known.

40 It will be understood that no restriction is made to the particular form of embodiment illustrated in the drawing, which is quoted merely by way of example, and that numerous modifications are quite possible within the meaning of the above description and the annexed claims without departing from the spirit of the invention.

45 What I claim as new and desire to secure by Letters Patent is:

1. A method for graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil which has a clean 50 fine and smooth surface in smoothly supported curved condition to the combined action of a wire brush and an abrasive powder simultaneously in several widely different directions.

55 2. A method for graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil which has a clean fine and smooth surface in smoothly supported curved condition to the combined action of a 60 wire brush and an abrasive powder simultaneously in several widely different directions during unidirectional travel of the foil.

3. A method for graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil which has a clean 65 fine and smooth surface in smoothly supported curved condition to the combined action of a wire brush and a sludge containing an abrasive powder simultaneously in several widely different directions during unidirectional travel of the foil.

70 4. A method for graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil which has a clean fine and smooth surface in smoothly supported 75 curved condition to the combined action of a wire

brush and a sludge containing powdered pumice stone simultaneously in several widely different directions during unidirectional travel of the foil.

5. A method of graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil which has a clean 5 fine and smooth surface in a curved smoothly supported condition, to the combined action of a wire brush and a sludge containing an abrasive powder simultaneously in several widely different 10 directions.

6. A method for graining very thin metal foil for lithographic purposes which comprises subjecting progressively said foil, which has a clean, 15 fine and smooth surface in a curved smoothly supported condition, to the combined action of a wire brush and an abrasive powder, said brush moving the powder under varying angles relative to the edges of the foil.

7. A method of preparing metal foil for litho- 20 graphic purposes, which comprises subjecting said foil, which has a clean, fine and smooth surface in a curved condition smoothly supported through an angle of at least 90° at substantially the same time to the action of a wire brush and an 25 abrasive powder simultaneously in several widely different directions during unidirectional travel of said foil.

8. A machine for producing grained metal foil for lithographic purposes comprising a drum for 30 supporting said foil, means for stretching said foil around at least a quarter of the circumference of said drum, a rotary roughening wire brush rotatable about an axis at right angles to the axis of said drum located adjacent said drum 35 so as to act upon said foil while on said drum simultaneously in several widely different directions and means for conducting an abrasive powder to said foil upon said drum in the vicinity of the action of said brush.

9. A machine for producing grained metal foil for lithographic purposes comprising a drum for 40 supporting said foil, a rotary roughening brush located adjacent said drum so as to act upon said foil while on said drum, means for conducting an 45 abrasive powder to said foil upon said drum in the vicinity of the action of said brush and means for removing said abrasive powder from said drum.

10. A machine for producing grained metal foil 50 for lithographic purposes comprising a drum for supporting said foil, means for stretching said foil around a part of the circumference of said drum, a rotary roughening wire brush rotating 55 about an axis at an angle to the axis of said drum located adjacent said drum so as to act upon said foil while on said drum and means for conducting an abrasive sludge to said point of action between said brush and foil and means for removing said abrasive sludge from said drum.

11. A machine for producing grained metal foil for lithographic purposes comprising means for 60 supporting said foil, a rotary roughening brush located adjacent said supporting means so as to act upon said foil, means for conducting an abra- 65 sive sludge to said point of action between said brush and foil and means for removing from said supporting means all traces of said abrasive sludge.

12. An apparatus for graining metal foil for 70 lithographic purposes comprising a supporting drum for said foil, a rotary brush located adjacent said drum so as to act upon said foil, means for supplying an abrasive sludge to the point of action between said brush and foil and means for 75

cleaning said drum so as to maintain the same at all times free of said abrasive sludge.

13. An apparatus for graining metal foil for lithographic purposes comprising a supporting drum for said foil, a rotary brush located adjacent said drum so as to act upon said foil, means for supplying an abrasive sludge to the point of action between said brush and foil, a second rotary brush acting upon said drum so as to remove from said drum abrasive sludge and means for supplying a cleaning fluid for washing said drum.

14. An apparatus for graining metal foil for lithographic purposes comprising a supporting drum for said foil, a rotary brush located adjacent said drum so as to act upon said foil, means for supplying an abrasive sludge to the point of action between said brush and foil, a second rotary brush acting upon said drum so as to remove from said drum abrasive sludge and means for supplying a cleaning fluid cooperating with said second brush.

15. An apparatus for preparing grained metal

foil for lithographic purposes comprising a supply roller for metal foil, a rotating drum adjacent said supply roller around which said foil is led, means for maintaining said supply roller in constant contact with said rotating drum, a rotary brush located adjacent said drum for operating upon said foil and means for supplying an abrasive sludge to the point of action between said brush and foil.

16. An apparatus for preparing grained metal foil for lithographic purposes comprising a supply roller for said foil, a rotary drum about which said foil is led through an angle of at least 90°, means for brushing said foil while on said drum simultaneously in several widely different directions, means for supplying an abrasive sludge to the point of action between said brushing means and foil, a second brush for cleaning said foil as it is led from said drum, means for washing said foil upon both sides thereof, a third brush for cleaning said drum and means for washing said drum.

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