April 28, 1942. J. BJORKSTEN ET AL. 2,281,260

MEANS FOR AND METHOD OF PREPARING MASTER COPY SHEETS

Filed Dec. 15, 1939

Fig. 1.

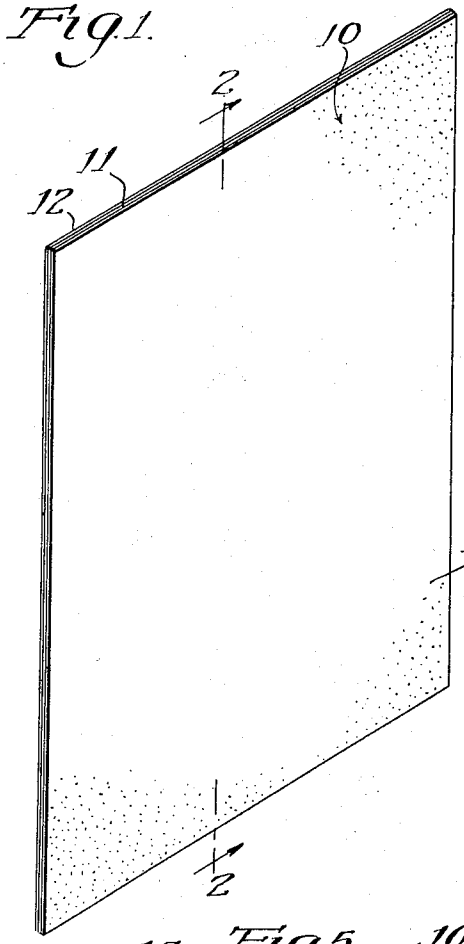



Fig. 2.

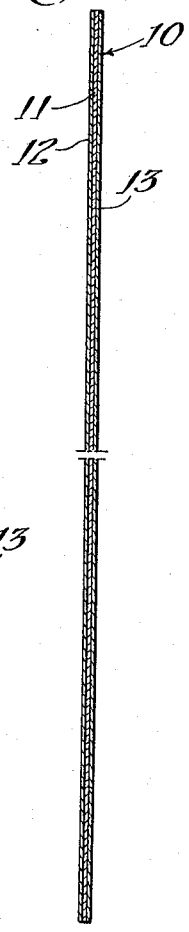



Fig. 3.

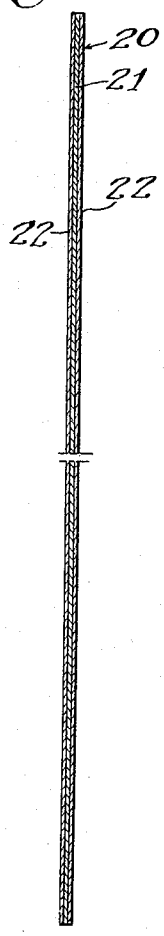



Fig. 4.

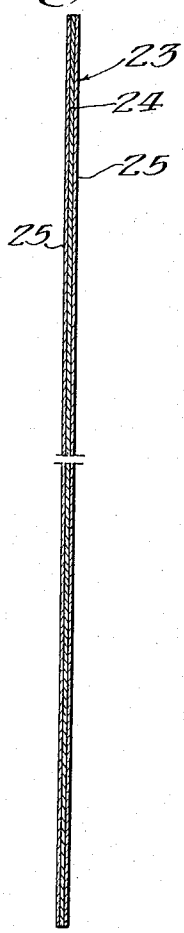



Fig. 5.

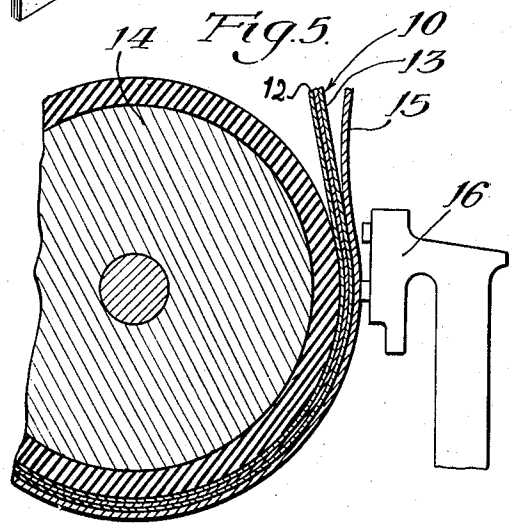
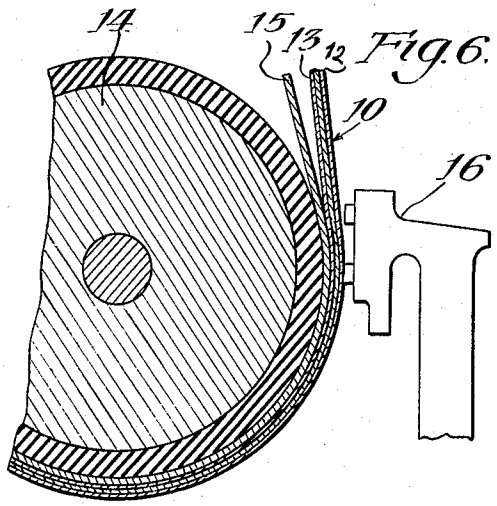



Fig. 6.




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# UNITED STATES PATENT OFFICE

2,281,260

## MEANS FOR AND METHOD OF PREPARING MASTER COPY SHEETS

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Application December 15, 1939, Serial No. 309,364

4 Claims. (Cl. 41—41.5)

The invention relates to a method of and means far preparing master sheets or plates from which a relatively large number of copies can be made by bringing the copy sheets into contact with the data on the master sheet or with an offset blanket to which the data has been transferred from the master sheet.

One form of the invention is embodied in a method for typewriting or otherwise marking the data to be duplicated upon a flexible metallic printing plate or master sheet. The master sheet or printing plate is preferably formed from aluminum foil which may be backed with paper, if so desired. If the printing plate is to be utilized by pressing the copy sheets directly against the data to be duplicated, one typewrites or marks the data to be duplicated on the master sheet by typing or writing with a stylus upon the back surface thereof while its printing surface is contacted by a suitable transfer sheet. If the master sheet is to be employed with the offset method of printing or duplicating, one types or writes with a stylus upon the back surface of the transfer sheet which has a coating contacting the master sheet, the coating being adapted to form the data upon the printing surface of the master sheet. In practicing the improved method, there is used a transfer sheet comprising a base sheet having a layer on both sides thereof (and preferably extending through the base sheet) of a soft yielding material whereby the pressure of the type against the transfer sheet or the master sheet is equalized and distributed. This improves the clarity and distinctness of the impressions obtained on the master sheet. The soft yielding material may suitably be a soft plastic material which is flowable on application of pressure from the keys of a typewriter. Such material includes paraffine wax, other solid or semi-solid oleaginous material, waxes or mixtures of waxes and oleaginous material with resin, and like compositions having the general flow characteristics of the paraffine waxes.

Other objects and advantages of the invention will become apparent as the following detailed description progresses, reference being had to the accompanying drawing, wherein—

Fig. 1 is a perspective view of a transfer sheet which embodies the invention;

Fig. 2 is a section taken on line 2—2 of Fig. 1;

Fig. 3 is a section taken through a transfer sheet which embodies another form of the invention;

Fig. 4 is a section taken through a transfer sheet which embodies still another form of the invention;

Fig. 5 is a fragmentary section taken through the platen of a typewriter and illustrates one form of the improved method; and

Fig. 6 is a fragmentary section taken through the platen of a typewriter and illustrates another form of the improved method.

Referring for the present to Figs. 1 and 2 wherein a transfer sheet embodying a preferred form of the invention is illustrated, the reference character **10** designates the transfer sheet generally. The transfer sheet **10** preferably comprises a sheet of paper **11** which is provided on one side with a layer **12** of paraffine, the other side of the sheet being provided with a layer **13** which is a soft yielding composition comprising an oleaginous ink binding agent and an adhesive resin which is compatible with the oleaginous material. Such yielding composition preferably impregnates and extends through the paper **11**. This composition is more fully described in the co-pending application Serial No. 188,706, filed February 4, 1938, by Johan Bjorksten and William J. Champion.

In Fig. 5 one method of employing the transfer sheet **10** is illustrated. The transfer sheet **10** and a flexible aluminum sheet **15** are shown trained over a platen roller **14** of a typewriter, the transfer sheet **10** being disposed between the aluminum sheet **15** and the platen roller **14**. A type bar is shown at **16** as it appears when it strikes the exposed side of the aluminum sheet. The transfer sheet is preferably positioned so that the layer **13** contacts the aluminum sheet **15** and the layer **12** contacts the platen roller **14**. When the type bar **16** strikes the aluminum sheet, the character being typed is formed in the aluminum sheet **15** from the composition of the coating **13**. In this method there is no clogging of the keys of the typewriter and an especially clear-cut mirror reverse image of the data to be duplicated is obtained on the aluminum master sheet **15**. Of course, one may write with a stylus or the like on the sheet **15** and thus form the data to be duplicated from the layer **13**. When the aluminum sheet **15** is to be used to obtain copies of the data to be duplicated, the sheet is first moistened with an ink repellent which does not adhere to the data formed from the layer **13**. Ink is then applied to the data to be duplicated and a copy sheet is pressed against the data to be duplicated to obtain a copy thereof. After each copy is taken, the aluminum sheet **15**

is preferably moistened with the ink repellent, and the data to be duplicated are re-inked.

In Fig. 6, the aluminum sheet **15** is shown between the platen roller **14** and the type bar **16** so that the data to be duplicated will be formed in positive upon the aluminum sheet **15**. The transfer sheet **10** is preferably placed with its coating **13** against the aluminum sheet. The data on the sheet **15** are re-inked after the sheet has been treated with an ink repellent and then copies are made by using an off-set process.

In Fig. 3 a transfer sheet **20** embodying another form of the invention is shown. The transfer sheet **20** preferably comprises a sheet of paper **21** having layers **22** on both sides thereof, the layers being formed of paraffine. While paraffine is not as satisfactory as the substance from which the layer **13** is formed, yet it may be used to obtain a relatively large number of copies.

In Fig. 4 a transfer sheet **23** is shown, which transfer sheet **23** comprises a sheet of paper **24** which has layers **25** on both sides thereof, the layers being preferably formed of solid or semi-solid oleaginous material. The layers are produced by first coating one side of the sheet **24** and then subjecting the coated sheet to heat or pressure, or both, so as to cause the oleaginous material to penetrate and impregnate the sheet **24** and to form layers on both sides thereof extending through the interstices of sheet **24**. It is contemplated that the method will be practiced in such manner that the layers on the two sides of the sheet **24** will be substantially equal in thickness and amount.

It has been found that when paraffine is employed as the transfer medium to form the data to be duplicated on the aluminum sheets, paraffine having a melting point of from 40° C. to 50° C. gives good results.

Examples of other suitable transfer compositions which may be used instead of paraffine for impregnating or coating the transfer sheet are:

*Example I*

| | Per cent |
|---|---|
| Opal wax | 10 |
| Paraffine M. P., 125° F | 90 |

*Example II*

| | Per cent |
|---|---|
| Soya bean oil | 10 |
| Carnauba wax | 20 |
| Paraffine, M. P. 125° F | 70 |

*Example III*

| | Per cent |
|---|---|
| Stearic acid | 20 |
| Paraffine, M. P. 140° F | 80 |

*Example IV*

| | Per cent |
|---|---|
| Hydrocarbon resin of M. P. 170° F. obtained by polymerization of cracked petroleum with aluminum chloride | 20 |
| Undecylenic acid | 20 |
| Carnauba wax | 60 |

It has been found that the provision of a soft yielding layer on the transfer sheet, such as, for instance, the layer **12**, equalizes and distributes the pressure from the impact of a typewriter against the sheets and improves the clarity and distinctness of the impressions obtained on the copy sheets. This is particularly true when the soft yielding material extends through the base sheet from one side to the other.

It is also contemplated to use two or more separate sheets, one sheet having the transfer layer and the other sheet being or having a soft yielding layer which may or may not be adapted for transfer. Preferably, however, there is used only a single, double-layer sheet which has the combined function of transferring and pressure equalizing.

While there have been shown and described certain forms of the invention, it is to be understood that it is capable of many modifications. Changes, therefore, may be made without departing from the spirit and scope of the invention as described in the appended claims, in which it is the intention to claim all novelty inherent in the invention as broadly as possible, in view of the prior art.

We claim:

1. The method of preparing a master copy sheet for use in a planographic or like duplicating process, which method comprises typing data to be duplicated against one side of an assembly comprising a metal master sheet in contact with a transfer sheet, said transfer sheet comprising a base paper sheet impregnated and coated on both sides with an oleaginous composition.

2. The method of preparing a master copy sheet for use in a planographic or like duplicating process, which method comprises typing data to be duplicated against one side of an assembly comprising a metal master sheet in contact with a transfer sheet, said transfer sheet comprising a base paper sheet impregnated and coated on both sides with an oleaginous composition, the oleaginous composition on the side next to the master sheet including a resin.

3. The method of preparing a master copy sheet for use in a planographic or like duplicating process which comprises placing a metal master sheet against a prepared sheet of fibrous material having a layer of oleaginous transfer material on both sides and extending through the interstices of the fibrous sheet, said master sheet being in contact with one of the oleaginous transfer layers, impressing the matter to be copied on the exposed surface of the master sheet whereby the copy of said matter is imposed in mirror reverse on the underside of said master sheet, said mirror reverse image being represented by oleaginous material transferred to the master sheet, and separating the master sheet from the contacting sheet.

4. A transfer sheet of the type in which the transfer composition is transferable to a contacting sheet by pressure or impact as in a carbon paper, said transfer sheet comprising a base paper sheet impregnated with a soft yielding oleaginous material and having a layer on both sides of a soft yielding oleaginous material, one layer being a transfer layer and including an adhesive resin intimately mixed with the oleaginous material, and the other layer containing oleaginous material free from adhesive resin.

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