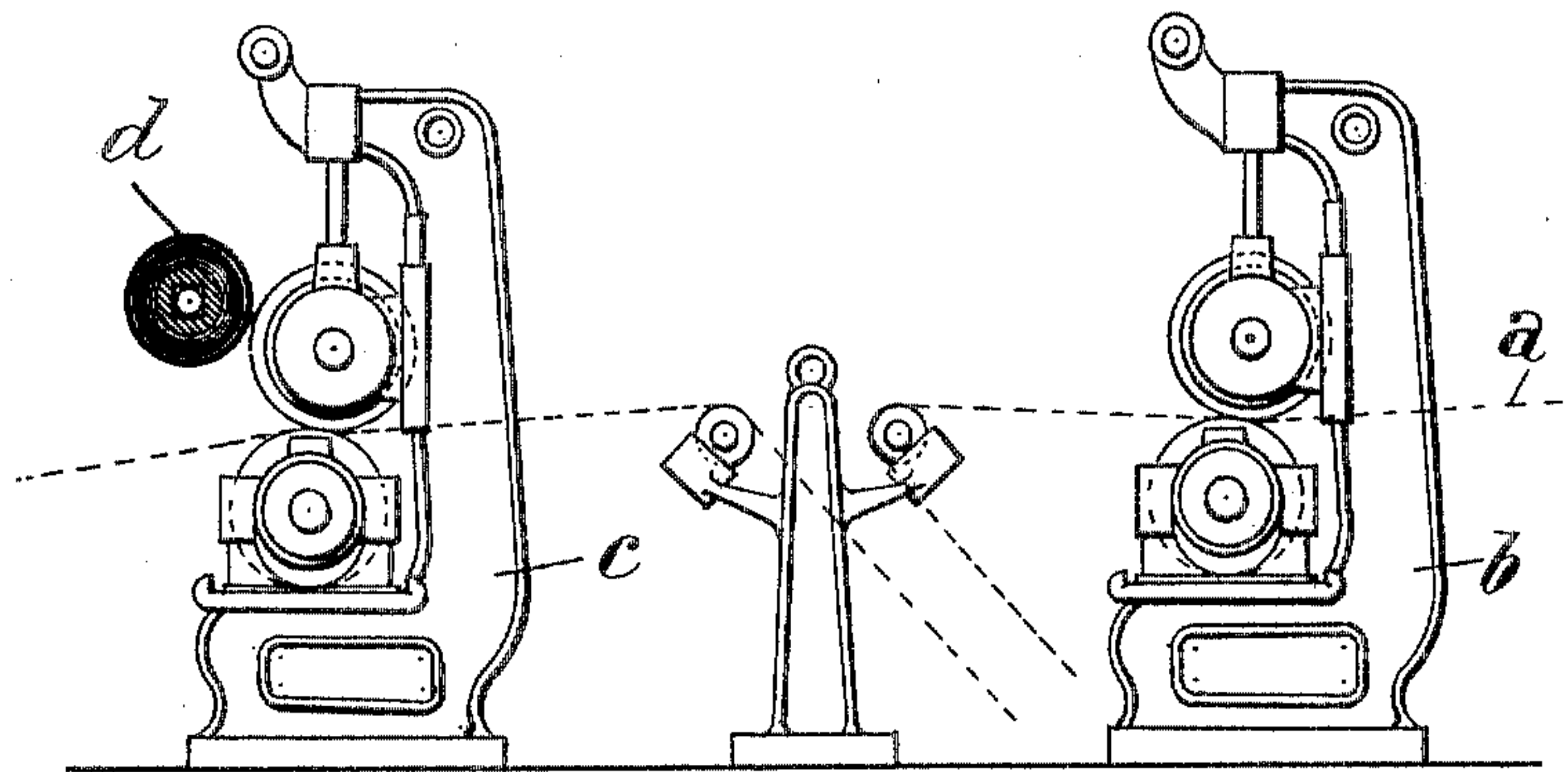


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PATENTED JULY 4, 1905.

G. ENGELMANN, JR.
MANUFACTURE OF DOUBLE PAPER.
APPLICATION FILED APR. 11, 1905.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORG ENGELMANN, JR., OF NEUSTADT-ON-THE-HARDT, GERMANY.

MANUFACTURE OF DOUBLE PAPER.

SPECIFICATION forming part of Letters Patent No. 793,832, dated July 4, 1905.

Application filed April 11, 1905. Serial No. 254,970.

To all whom it may concern:

Be it known that I, GEORG ENGELMANN, Jr., manufacturer, residing at Thalstrasse No. 73, Neustadt-on-the-Hardt, Palatinate, Germany, have invented certain new and useful Improvements in the Manufacture of Double Paper, of which the following is a specification.

The transfer process which is more particularly employed in ceramic industry as a substitute for hand-painting cannot when the ordinary thick papers are employed be made use of for very small surfaces, hollows, and projections of the object to be ornamented. It is therefore necessary to print the designs or pictures on a thin paper, which can easily adjust itself to the required configurations without damage to the picture of design. Such a thin paper, however, cannot be employed for the said purpose, as shown by experience, without providing it with a thicker backing, with which it is united in such manner that, on the one hand, it is sufficiently attached thereto in order to undergo all the manipulations and, on the other hand, that it can be afterward easily separated from the backing without damage to the imprinted design.

It has heretofore not been possible to successfully prepare papers which possess the above-mentioned properties. Only one process has become known, (German Patent No. 144,553,) which, however, only solves the problem imperfectly. This process consists in causing a finished web of unsized thin paper to be brought together on the paper-making machine, with a web of sized paper still in the state of production, the stuff of the sized web after being heated to at least 25° centigrade being mixed with a binding material in the supply-trough in front of the wire-gauze, which binding material consists of animal or vegetable cementing material in a very fluid condition with the addition of beeswax or vegetable wax dissolved by alkali. The object of the addition of wax is to facilitate the subsequent separation of the two paper webs. This process, however, is subject to two essential disadvantages. On the one hand, the finished tissue-paper does not combine perfectly with the backing-paper because when subject to the

action of the couching-press the formation of creases can hardly be avoided. On the other hand, the intimate union of the two webs, which is effected by the couching-press, renders it necessary to add the above-mentioned wax in order to counteract such intimate union. This wax, however, has a detrimental reaction upon the printing-colors with which the tissue-paper is subsequently impressed. According to the present invention the said two disadvantages are obviated by causing the tissue-paper to be combined with the backing-paper at the second or first wet cylinder-press, the arrangement for this purpose being such that the roller carrying the tissue-paper is brought into close contiguity to the upper pressing-cylinder, so that such paper is made to pass round this cylinder and is united with the backing-paper in passing between the two press-cylinders, being thereby automatically drawn off from the roller. The close contiguity of the tissue-paper roller is necessary in order to insure the absence of creases, and the thinner the tissue-paper is the greater must be the extent of its contact with the press-cylinder. Of course with this arrangement the scraper usually applied to this cylinder is dispensed with and is unnecessary, as the backing-paper web passing through is not in contact with the cylinder, but with the intervening tissue-paper, and consequently there is no adhering of fibers, &c., from the soft backing-paper on the cylinder. With this method of manufacture no additions to the paper stuff of the backing-paper are required, only ordinarily sized and well ground and felted stuff being necessary. It is of advantage to employ rag stuff or stuff from rags mixed with cellulose. For the sizing any ordinary good resin size can be employed. The backing-paper web is still sufficiently moist when passing through the second or first cylinder-press to insure its combining in a reliable manner with the tissue-paper, while at the same time it is sufficiently smooth and dry in order to insure its ready separation when the double paper is being used for the transfer process.

On the accompanying drawing, which only shows so much of a paper-making machine as

is necessary for the purposes of the invention, the arrangement for carrying out the process is shown. The web *a* of the backing-paper coming from the couching-press passes 5 through the first wet press *b* and is combined with the tissue-paper in the second press *c*. The tissue-paper is coiled upon a roller *d* the rotation of which is only resisted by the friction in its bearings. The paper passes round 10 the upper press-cylinder and in passing between the two cylinders is applied without creases to the already-formed wet backing-paper web *a*. The roller *d* with the tissue-paper could also be arranged in connection 15 with the first press *b*.

Now what I claim, and desire to secure by Letters Patent, is the following:

1. In the manufacture of double paper for the transfer of designs and the like the process which consists in combining a finished web 20 of tissue-paper with a moist web of backing-paper, whereby the tissue-paper is fed to the web of backing-paper at one of the wet cylinder-presses substantially as described.

25 2. In the manufacture of double paper for the transfer of designs and the like the process which consists in combining a finished web of tissue-paper with a moist web of backing-paper, whereby the tissue-paper is coiled 30 upon a roller and fed to the web of backing-paper at one of the wet cylinder-presses substantially as described.

3. In the manufacture of double paper for the transfer of designs and the like the proc-

ess which consists in combining a finished web 35 of tissue-paper with a moist web of backing-paper, whereby the tissue-paper is coiled upon a roller situated closely contiguous to the upper press-cylinder of one of the wet cylinder-presses and fed to the web of backing-paper 40 substantially as described.

4. In the manufacture of double paper for the transfer of designs and the like the process which consists in combining a finished web 45 of tissue-paper with a moist web of backing-paper, whereby the tissue-paper is coiled upon a roller situated closely contiguous to the upper press-cylinder of one of the wet cylinder-presses and fed to the web of backing-paper, while passing between the upper and 50 lower press-cylinders substantially as described.

5. In the manufacture of double paper for the transfer of designs and the like the process which consists in combining a finished web 55 of tissue-paper with a moist web of backing-paper, whereby the tissue-paper is fed to the web of backing-paper at the second wet cylinder-press substantially as described.

In testimony that I claim the foregoing as 60 my invention I have signed my name, in presence of two witnesses, this 24th day of March, 1905.

GEORG ENGELMANN, JR.

Witnesses:

TH. HOFFMANN,
MAX ROTH.