Nov. 14, 1950 R. S. REYNOLDS 2,529,884

METHOD OF LAMINATING METAL FOIL

Filed June 17, 1946

Fig. 1.

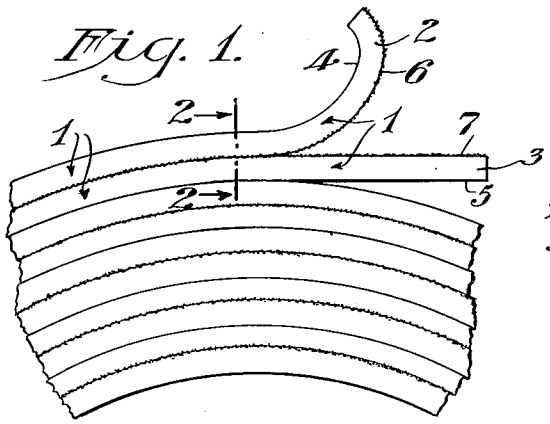


Fig. 2.

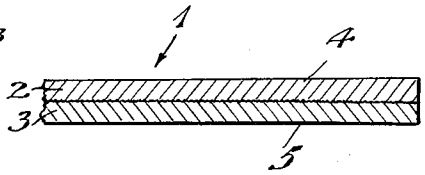


Fig. 3.

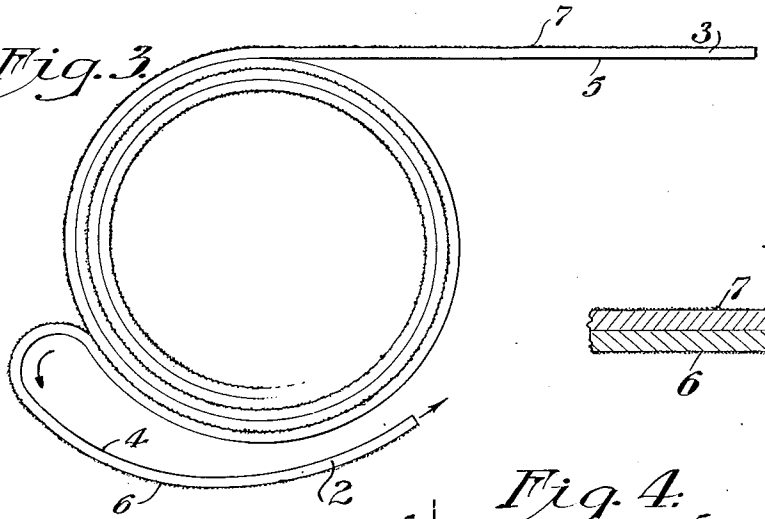


Fig. 5.

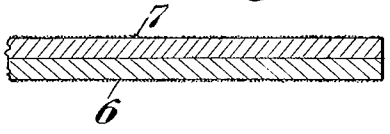
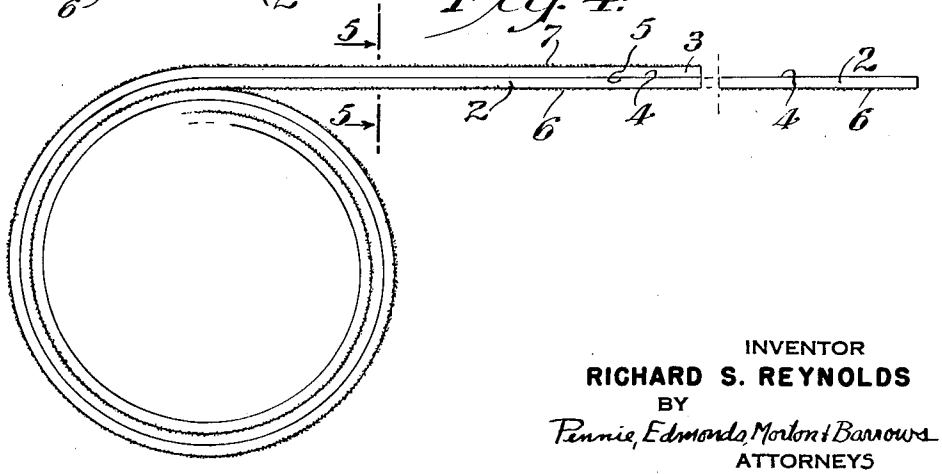


Fig. 4.



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METHOD OF LAMINATING METAL FOIL

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Application June 17, 1946, Serial No. 677,385

1 Claim. (Cl. 154—129)

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This invention relates to metal foil, and particularly to double sheets of foil which were rolled together in close face-to-face contact and coiled as a single sheet (hereinafter called a "double-foil sheet"), and has for its object an improved method of uncoiling the sheet and separating the foils.

Each of such foils has an exterior polished surface resulting from contact with the reduction rolls and a mat surface resulting from contact with the other foil. In the bonding of such foil to paper or other sheet material, as for use in packages, it is advantageous to attach adhesively the mat surface to the other sheet material because it gives a better bond and to leave the polished surface on the exterior because of its better appearance.

My invention is especially concerned with the separation of the two foils of the double-foil sheet so that the mat surfaces may be adhesively attached to other sheet material and provides a very simple and effective method of reversing the positions of the two foils in the double-foil sheet to place the mat surfaces on the outside while unwinding the coil. In accordance with my invention, I unwind the coil, and while so doing, I reverse the positions of the foils. In other words, I turn the double-foil sheet inside-out. In carrying out a method of my invention, I simply strip the exterior sheet of foil back one turn of the coil and then place it in face-to-face contact with the original interior sheet of foil, forming a new double-foil sheet with the polished surfaces face-to-face and the mat surfaces on the outside. This new double-foil sheet is unwound as is the original double-foil sheet.

In the accompanying drawings illustrating the invention:

Fig. 1 is a fragmentary enlargement of the end of a coil of foil wound from a double-foil sheet;

Fig. 2 is a view along line 2—2 of Fig. 1;

Figs. 3 and 4 are diagrammatic representations of the ends of a double-foil sheet in coil form illustrating the method of the invention, and

Fig. 5 is a view along line 5—5 of Fig. 4.

While the invention is applicable to the treatment of various metal foils, it is especially advantageous when used in the uncoiling of aluminum foil. Aluminum foil may be rolled from two superposed sheets to produce a double-foil sheet, the foils of which are exceedingly thin but, nevertheless, capable of separation in a practicable manner. I shall, accordingly, describe my invention with reference to aluminum double-foil sheets. Such foils may vary in thickness

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from around, say, 0.00012 inch (approximately 555 square feet per pound) to considerably greater thickness. As shown in the drawings, where the foils are greatly exaggerated in thickness, the double-foil sheet 1 comprises a foil 2 which is in the exterior position and foil 3 which is in the interior position as wound into a coil in the rolling operation. The exterior surfaces 4 and 5 are very smooth and uniform (herein called "polished") from contact with the rolls while the interior surfaces 6 and 7 are dull or mat because they were worked against each other.

In the first step of my method, I separate the two sheets and peel the exterior sheet 2 backward, as shown in Figs. 1 and 3. Then I place the sheets 2 and 3 in face-to-face position with the polished faces 4 and 5 together. The projecting turn of foil 2 is severed at the end of foil 3, as shown in Fig. 4, and the new double-foil sheet is ready to be pulled from the coil. This may be done by feeding the new double-foil sheet through any suitable operation for bonding, especially adhesively attaching, the mat surfaces to one or more other sheets of material such as paper.

In my application Serial Number 705,175, filed October 23, 1946, is described and claimed a method and apparatus for bonding paper to the foils of a double-foil sheet. This invention is advantageously adaptable to use in such operations and the two foils may be reversed from their original positions and fed continuously through the operations of said application. I may, accordingly, adhesively attach a sheet of paper, a sheet of cellulosic or resinous material or other sheet metal to the mat surface of one or both sheets of foil. In accordance with said application, I may attach the sheet of paper, or the like, to both mat surfaces and produce a laminated structure with the paper between the two sheets of foil and with the polished surfaces on the exterior.

I claim:

A method of applying a reinforcing material to extremely thin metal foil comprising the steps of rolling two sheets of extremely thin metal foil together in superimposed relation between rollers so as to produce a double-foil sheet wherein said sheets of metal foil have mat surfaces in face-to-face contact and polished exterior surfaces, winding said double-foil sheet into a coil whereby one of said sheets of metal foil will be exterior and the other of said sheets of metal foil will be interior peeling back the exterior sheet of foil for about one turn of the coil until it meets the

interior sheet of foil, placing the polished surfaces in face-to-face contact to form a new double-foil sheet, unwinding the new double-foil sheet from the coil and leading at least one of the mat faces of the new double-foil sheet into bonding contact with a sheet of other material while the polished surfaces of the two sheets of foil are still in face-to-face contact.

RICHARD S. REYNOLDS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,490,891	Fichtmueller	Apr. 15, 1924
1,609,222	Taylor	Nov. 30, 1926
1,998,506	Jones	Apr. 23, 1935
2,268,673	Reynolds	Jan. 6, 1942
2,395,668	Kellgren et al.	Feb. 26, 1946