# United States Patent

**Smith et al.**

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[54] **ROLLS FOR USE IN MANUFACTURE OF BATTERY**


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[51] **Int. Cl.**.....**B21h 8/00,** B21h 9/00

[58] **Field of Search** .....29/2, 121; 72/198



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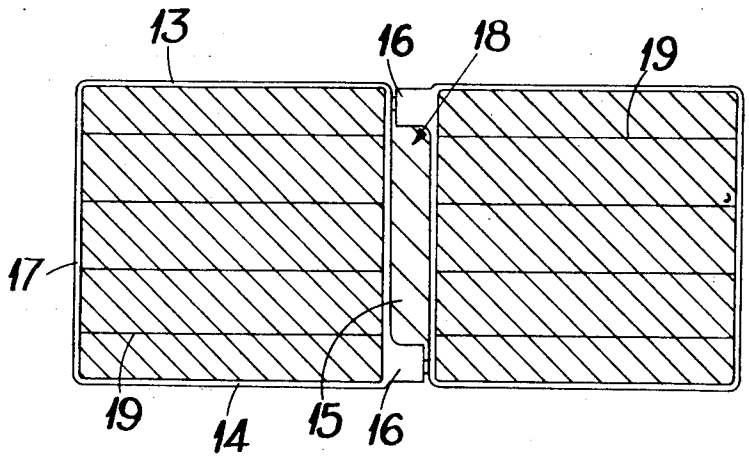
[57] **ABSTRACT**

A roll for use in the manufacture of a battery plate grid is used in conjunction with a further roll, each roll having at least one separate impression of one face of the required grid. The space on each roll whose base is defined by the upper frame member and whose height is defined by a lug extending from the upper frame member, is formed with interruptions into which the strip from which the grid is being formed will key during the rolling process.


**2 Claims, 2 Drawing Figures**



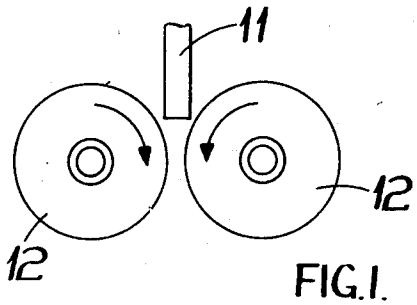



FIG. 1.

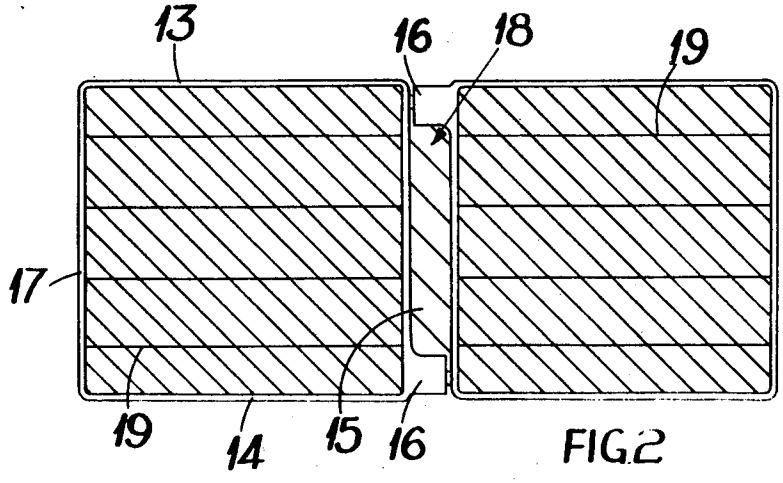



FIG. 2

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# ROLLS FOR USE IN MANUFACTURE OF BATTERY

This invention relates to the manufacture of lead battery plate grids. Such grids are not commonly made from pure lead, and the term "lead" is used herein to indicate not only the normal lead compounds used to manufacture grids, but also dispersion strengthened lead. In order to assist in explaing the invention, the term "grid" is defined as an open mesh network which for the sake of convenience can be considered to be vertical, and comprises upper, lower and a pair of side frame members, the upper member having a lug integral therewith, and integral ribs interconnecting the frame members.

It is known to manufacture such battery plate grids by passing a strip of the grid material between rolls containing an impression of the grid. This process leaves fillets between the ribs, and between the ribs and frame members, and these fillets are removed by a blanking operation. The usual arrangement is for the rolls to contain impressions of several grids, so that a number of grids are made for each rotation of the rolls. Because each grid has a lug at one end, there will be on each roll a space to the side of the part of the roll which is used to form the lugs. Assuming that the impressions on the roll all extend circumferentially round the roll in the same direction, then this space will be between the upper frame member of one impression and the lower frame member of the next impression. However, a common arrangement is to have oppositely directed impressions on the rolls, and in this case the space referred to will be bounded by the upper frame members of a pair of adjacent impressions, and by the lugs corresponding to these impressions. In either case, this space is usually plane. Assuming that the impressions on the roll each extend axially to the roll, as opposed to the circumferential arrangement described above then the space referred to will be bounded by the lugs of an adjacent pair of grids, the edge of the strip and by the upper frame member or members dependent on their relevant disposition. Other arrangements may be used.

It is a matter of some importance to control the way in which the strip of material passes between the rolls. If the strip is gripped too tightly by the rolls, it may adhere to one or both of the rolls and become torn. On the other hand, if there is insufficient grip, the strip may slip through the rolls without being properly formed. The portion of the rolls between the lug referred to above gives a particular difficulty, because there is no control of the strip in this region. The invention, which seeks to overcome this problem, consists in one aspect in a roll for use in conjunction with a further roll in forming a battery plate grid from a strip of the grid material, the roll having thereon at least one separate impression of one face of the required grid in in which the space on the roll whose base is defined by the upper frame member and whose height is defined by the lug extending therefrom, is formed with interruptions into which in use the strip from which the grid is being formed will key.



Preferably the interruptions are in the form of continuations of the grid pattern.

The invention further resides in a method of manufacturing a grid using a roller of the form specified above.

An example of the invention is illustrated in the accompanying drawings, in which

FIG. 1 illustrates a strip being passed between two rolls, and

FIG. 2 illustrates part of the surface of one of the rolls.

Referring to FIG. 1, a strip **11**, typically of dispersion strengthened lead, is passed between a pair of rolls **12** between which pressure is applied to form the required grid.

FIG. 2 illustrates part of the surface of one of the rolls **12**, which typically has four grid patterns formed thereon and extending circumferentially round the rolls, two of the patterns being seen in FIG. 2. The dotted lines in FIG. 2 represent patterns which will appear on the other roll. Each grid will be formed with side frame members **13** and **14**, and upper frame members **15** having a lug **16** integral therewith, and a lower frame member **17**. The grid forming portions are oppositely directed on the roll, so that a pair of lugs **16** on successive grid patterns are at opposite edges of the roll, but aligned considered in an axial direction, so that between the lugs **16** there is a space **18**. Each grid further includes ribs **19** extending parallel with the side frame members, together with diagonal ribs extending in opposite directions on opposite sides of the grid to be formed. When the grid is rolled, there will be fillets of lead between the ribs, and between the ribs and frame members, and these fillets are removed by cropping.

With the arrangement thus far described, the strip of material is not controlled accurately at all times for the reasons explained earlier. In order to overcome this problem, the space **18** is interrupted, conveniently as shown by continuations of the diagonal rib patterns, so that control of the strip **11** is effected at all times.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

**1.** A roll for use in conjunction with a further roll in the manufacture of a lead battery plate and (as herein defined) wherein the roll has thereon at least one separate impression of one face of the required grid in which the space on the roll whose base is defined by the upper frame member and whose height is defined by the lug extending therefrom, is formed with interruptions into which in use the strip from which the grid is being formed will key.

**2.** A roll as claimed in claim **1** wherein said interruptions are in the form of continuations of the grid pattern.

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