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(71) Applicant: **Beheermaatschappij De Boer Nijmegen B.V.**
**NL-6541 BS Nijmegen (NL)**

(72) Inventor: **Hofs, Bernardus Theodorus**
**NL-7451 CL Holten (NL)**

(74) Representative: **Hoijtink, Reinoud et al**
**Arnold & Siedsma,**
**Advocaten en Octrooigemachtigden,**
**Sweelinckplein 1**
**NL-2517 GK Den Haag (NL)**

## (54) Apparatus for manufacturing green bricks for the production of bricks

(57) An apparatus for manufacturing green bricks for the production of bricks comprises a conveyor (2) movable in stepwise manner. Mould containers (3) separated into compartments by dividing walls are placed on the conveyor (3). Strands of clay are formed from a supply holder (6) and cut to length at the bottom, whereafter the formed strand pieces fall onto a first conveyor belt (8) of a successive series of conveyor belts. The series of conveyor belts (8,9,10,11,12,13) connect to each other in a cascade, wherein the formed pieces of clay fall from one conveyor belt onto the other and are herein covered with sand on all sides. The sub-groups (14,15,16) comprising the supply means (6,7) and the series of conveyor belts (8,9,10,11,12,13) are oriented and displaced in a direction transversely of the transporting direction of conveyor (2). In this manner, the discharge point (17,18,19) of the supply means is displaced over a part of the width of the conveyor (2).

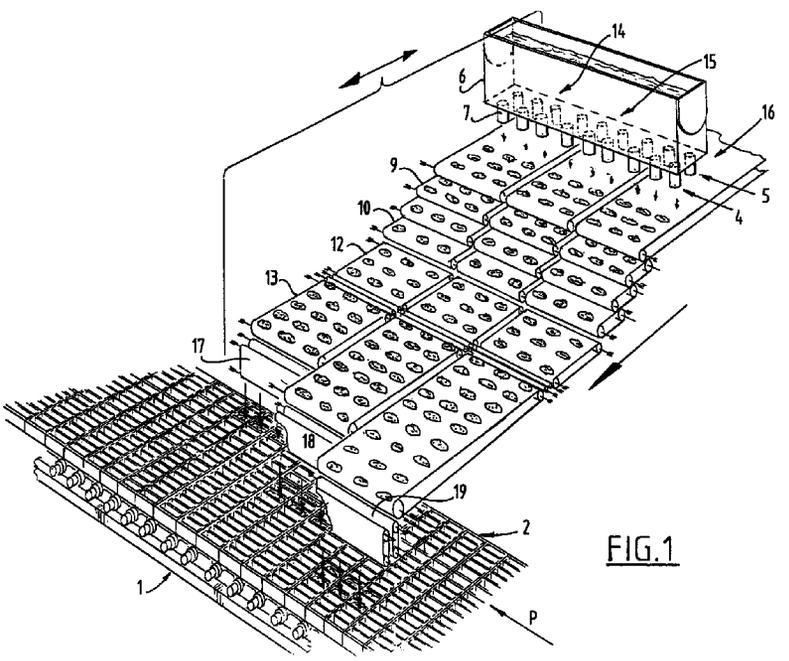


FIG.1

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## Description

The invention relates to an apparatus for manufacturing green bricks for the production of bricks, comprising a conveyor movable in stepwise manner for carrying mould containers separated into compartments by dividing walls, supply means for supplying pieces of clay to the mould containers, means for simultaneously forming groups of pieces of clay and simultaneously feeding a group to the supply means.

Such an apparatus is known for instance from "Handbuch für die Ziegelindustrie", Willi Bender et al., 1982, Bauverlag GmbH, Wiesbaden and Berlin, ISBN 3-7625-1485-2, p. 209-215 and fig. 7 on p. 214.

In order to form and place the green bricks in the mould containers a sizable and expensive apparatus would result if a separate supply device for clay pieces were present for each compartment.

It is the object of the invention to allow filling of the compartments in the mould containers to be performed by a collectively used device for forming pieces of clay and supplying the pieces to the different compartments. It is the further object of the invention to provide the means for supplying the pieces of clay with a light form.

This is achieved according to the invention by means for dividing a group into sub-groups and subsequently supplying the sub-groups to mould containers.

Through the division into sub-groups a relatively light construction is obtained per group, while due to successive supplying of the sub-groups to mould containers the supply means for each sub-group can be used for a number of mould containers.

In order to enable use of the same supply means for all mould containers the apparatus according to the invention is further characterized in that the discharge point of the sub-groups is displaceable in the direction transversely of the transporting direction of the conveyor for the mould containers.

The operation of the different means and the conveyors is preferably synchronized such that after each displacement stroke of the conveyor for the mould containers the discharge point is displaced.

According to the invention the discharge point is displaceable between two end positions, and between the end positions is displaced one step at a time over the distance between two compartments and, after performing the penultimate step, is displaced through a step which has the dimension of the width of one compartment in order to reach the end position.

The discharge points of the sub-groups are mutually shifted over a fixed distance.

According to a preferred embodiment the supply means consist of a plurality of conveyor belts connecting to each other in series, wherein for the different groups the last conveyor belt in a series has a length differing from the last in another group.

In addition, each group of conveyor belts is displaceable relative to the conveyor for mould containers together with the feed means for groups of pieces of clay on the series of conveyor belts.

The invention is further elucidated with reference to the drawings of an embodiment.

Fig. 1 shows a perspective view of an embodiment, and

Fig. 2a-2k and fig. 3 show the filling pattern of the different compartments in the mould containers.

The apparatus comprises a frame 1, inside which a conveyor 2 is displaceable in the direction of arrow P. Conveyor 2 is driven stepwise. As seen in lengthwise direction the conveyor carries a plurality of mould containers 3 sub-divided by dividing walls into compartments, in this embodiment 18.

The apparatus further comprises a plurality of, in this case two, series of nine sub-devices respectively 4, 5 placed one behind the other for forming pieces of clay. A strand of clay is formed from a supply holder 6 and cut to length at the bottom, whereafter the formed strand piece falls onto a first conveyor belt 8 of a successive series of conveyor belts. The series of conveyor belts 8, 9, 10, 11, 12, 13 connect to each other in a cascade, wherein the formed pieces of clay fall from the one conveyor belt onto the other and are herein covered with sand on all sides.

For the last conveyor belt 13 in the series a different length is chosen for each of the sub-groups 14, 15, 16. At the end of each last conveyor belt 13 is placed a conveyor belt pair respectively 17, 18 and 19 for the purpose of accelerating the fall of a piece of clay such that it is carried with comparatively great force into one of the compartments of the mould containers 3. The sub-groups 14, 15 and 16 are displaced in their entirety, i.e. the series of conveyor belts with the supply means 6, 7, in a direction transversely of the transporting direction of conveyor 2. In this manner the discharge point of the supply means is displaced over a part of the width of the conveyor. Due to the shifted character of the discharge point of the different sub-groups 14, 15 and 16 the whole width of the conveyor is thus covered.

Fig. 2a-2k show successively the manner of filling the compartments. After each displacement step of the conveyor the discharge point between the end positions corresponding with mould container 1 and 6 for sub-group 14, respectively 7 and 12 for sub-group 15 and 13 and 18 for sub-group 16 is displaced two steps at a time, while at the end position one step is carried out. For sub-group 14 this means that the compartments 1 of mould container 1, 2 and 3 and compartments 3 of mould container 1, 2 and 3 are successively filled (fig. 2a). A step is then taken by the conveyor (fig. 2b) such that thereafter compartments 5 and 6 of the following three mould containers are filled. The same pattern applies for the other sub-groups 14 and 16. The pattern according to fig. 3 finally results, wherein after a number of cycles a mould container is completely filled. All compartments of all mould containers are then filled on the conveyor. Atten-

tion is drawn to the fact that the progression of fig. 2a-2k applies only during initial operation of the apparatus.

## Claims

1. Apparatus for manufacturing green bricks for the production of bricks, comprising a conveyor movable in stepwise manner for carrying mould containers separated into compartments by dividing walls, supply means for supplying pieces of clay to the mould containers, means for simultaneously forming groups of pieces of clay and simultaneously feeding a group to the supply means, **characterized by** means for dividing a group into sub-groups and successively supplying the sub-groups to mould containers.

2. Apparatus as claimed in claim 1, **characterized in that** the discharge point of the supply means is displaceable in the direction transversely of the transporting direction of the conveyor for the mould containers.

3. Apparatus as claimed in claim 2, **characterized in that** after each displacement stroke of the conveyor for the mould containers the discharge point is displaced.

4. Apparatus as claimed in claim 3, **characterized in that** the discharge point is displaceable between two end positions, and between the end positions is displaced one step at a time over the distance between two compartments and, after performing the penultimate step, is displaced through a step which has the dimension of the width of one compartment in order to reach the end position.

5. Apparatus as claimed in claims 1-4, **characterized in that** the discharge points of the sub-groups are mutually shifted over a fixed distance.

6. Apparatus as claimed in claims 1-5, **characterized in that** the supply means consist of a plurality of conveyor belts connecting to each other in series, wherein for the different groups the last conveyor belt in a series has a length differing from the last in another group.

7. Apparatus as claimed in claim 6, **characterized in that** each group of conveyor belts is displaceable relative to the conveyor for mould containers together with the feed means for groups of pieces of clay on the series of conveyor belts.

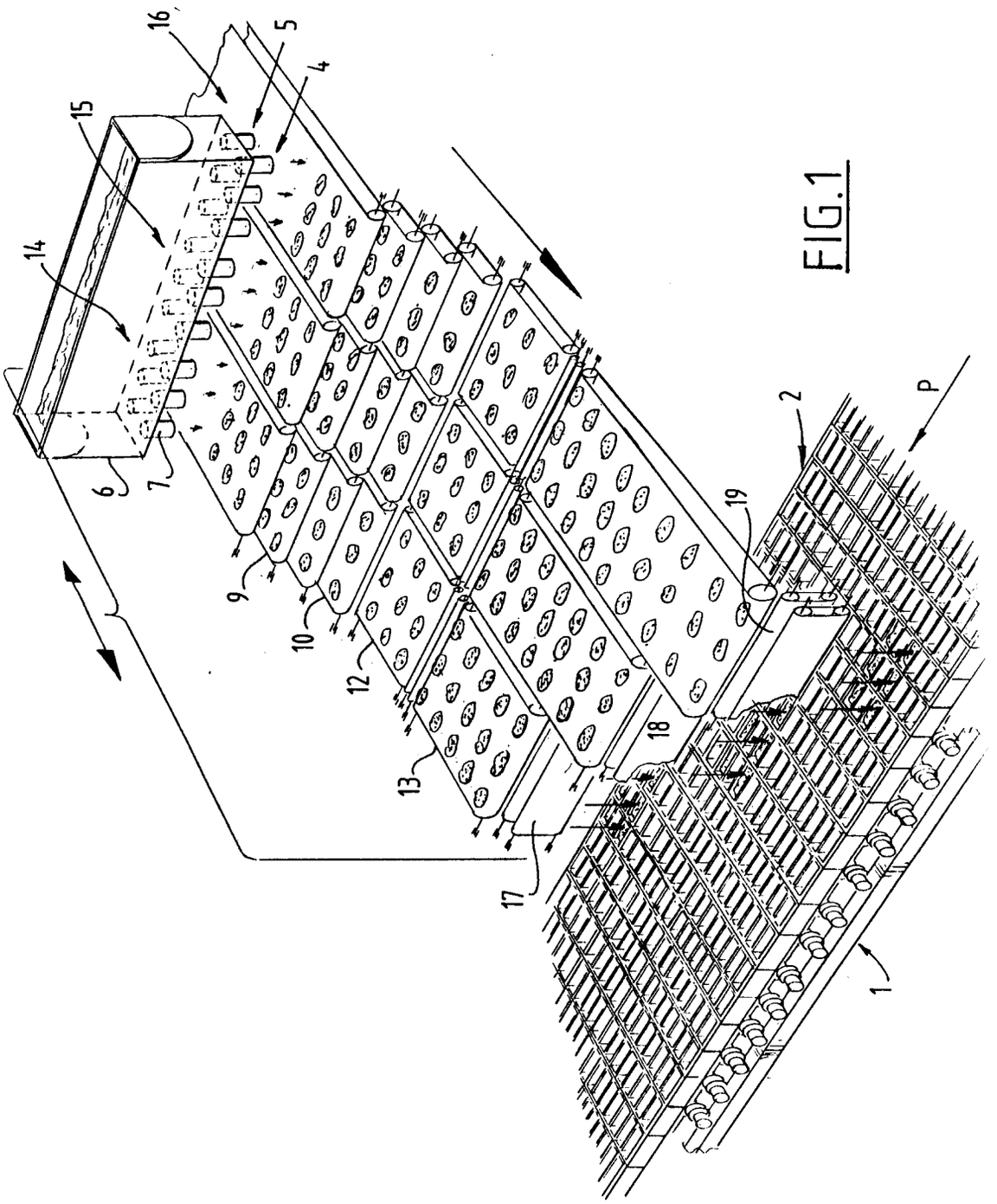


FIG.1

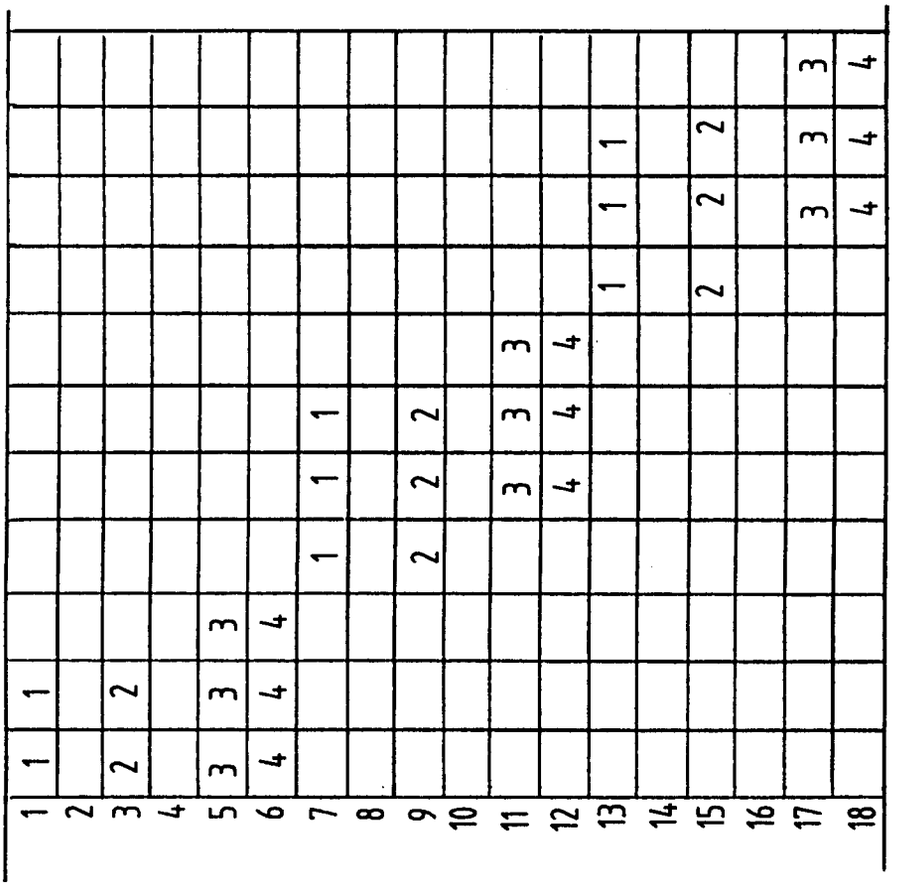

FIG.2b

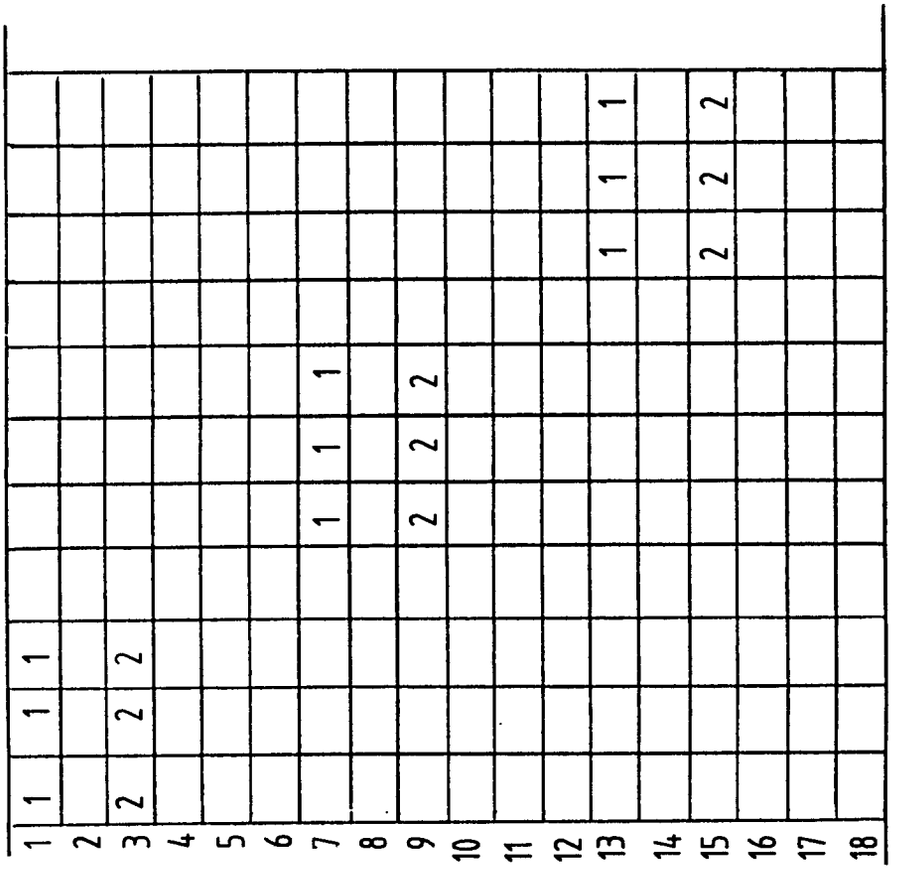

FIG.2a

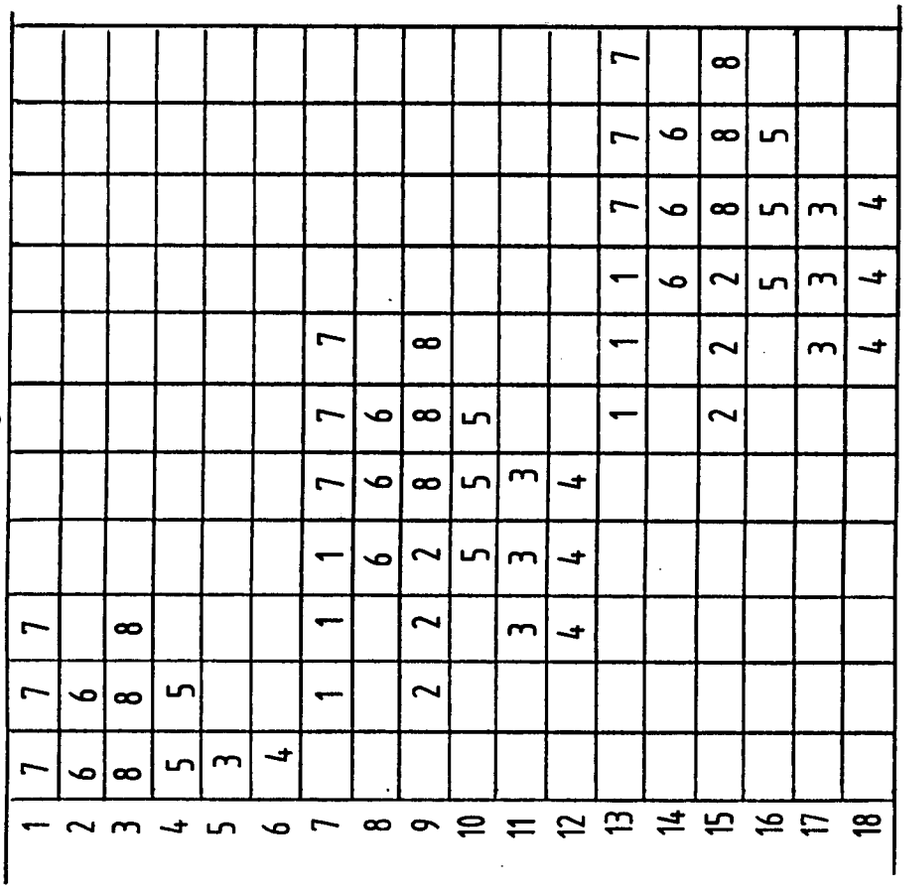

FIG.2d

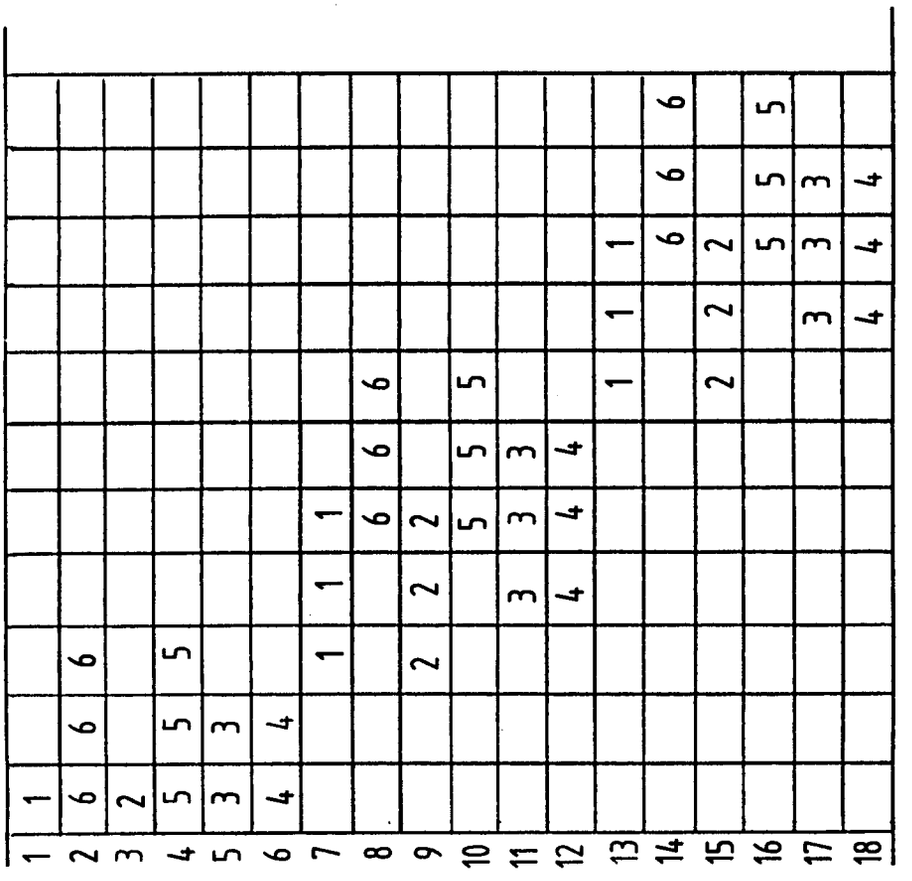

FIG.2c

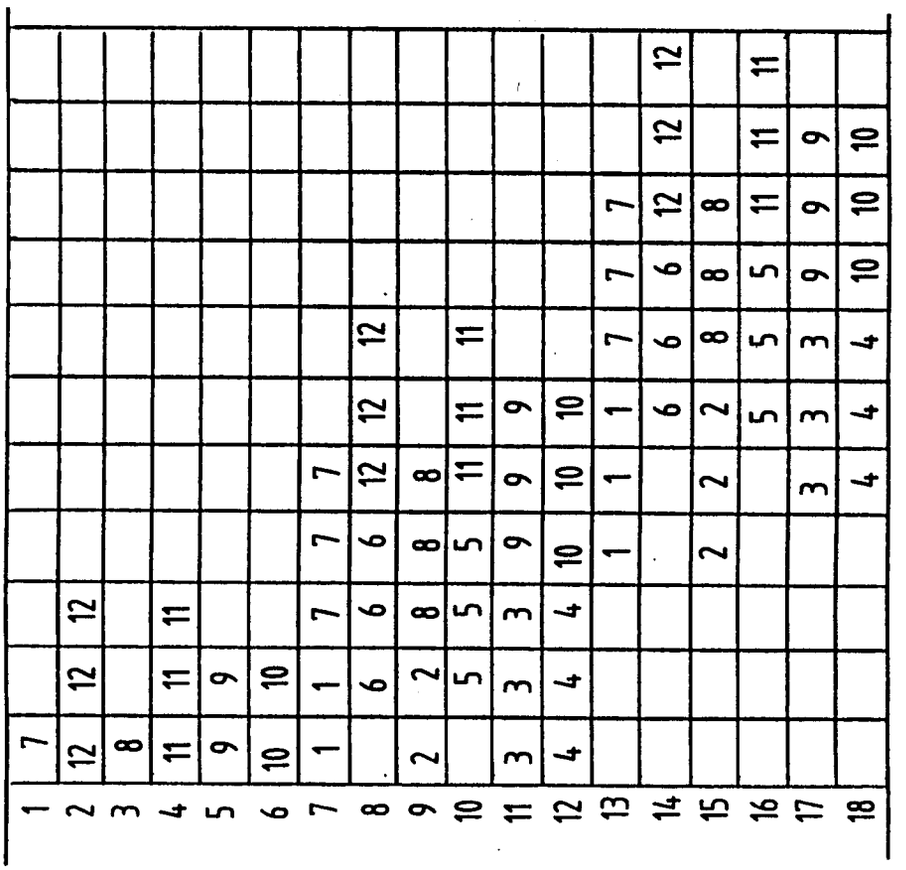

FIG.2f

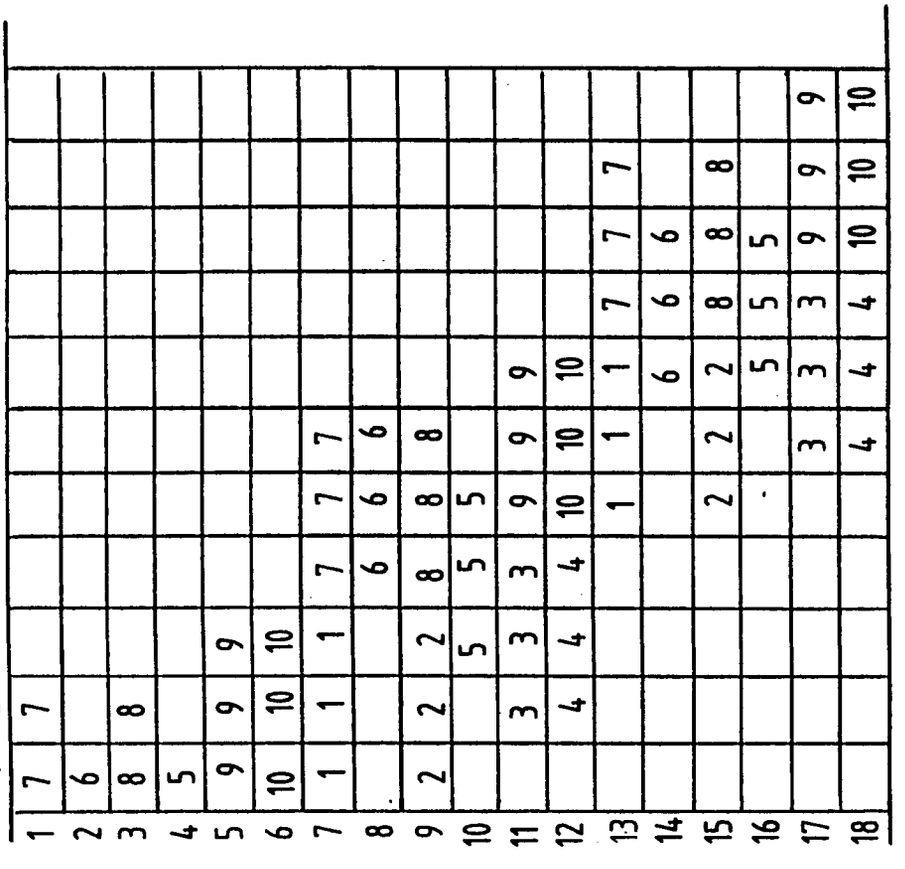

FIG.2e

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13 | 13 | 13 | | | | | | | | |
| 2 | 12 | 12 | | | | | | | | | |
| 3 | 14 | 14 | 14 | | | | | | | | |
| 4 | 11 | 11 | | | | | | | | | |
| 5 | 9 | | | | | | | | | | |
| 6 | 10 | | | | | | | | | | |
| 7 | 1 | 7 | 7 | 7 | 13 | 13 | 13 | | | | |
| 8 | 6 | 6 | 6 | 12 | 12 | 12 | | | | | |
| 9 | 2 | 8 | 8 | 8 | 14 | 14 | 14 | | | | |
| 10 | 5 | 5 | 5 | 11 | 11 | 11 | | | | | |
| 11 | 3 | 3 | 9 | 9 | 9 | | | | | | |
| 12 | 4 | 4 | 10 | 10 | 10 | | | | | | |
| 13 | | | 1 | 1 | 1 | 7 | 7 | 7 | 13 | 13 | 13 |
| 14 | | | | | 6 | 6 | 6 | 12 | 12 | 12 | |
| 15 | | | 2 | 2 | 2 | 8 | 8 | 8 | 14 | 14 | 14 |
| 16 | | | | | 5 | 5 | 5 | 11 | 11 | 11 | |
| 17 | | | | 3 | 3 | 3 | 9 | 9 | 9 | | |
| 18 | | | | 4 | 4 | 4 | 10 | 10 | 10 | | |

FIG.2g

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 13 | 13 | | | | | | | | | |
| 2 | 12 | | | | | | | | | | |
| 3 | 14 | 14 | | | | | | | | | |
| 4 | 11 | | | | | | | | | | |
| 5 | 15 | 15 | 15 | | | | | | | | |
| 6 | 16 | 16 | 16 | | | | | | | | |
| 7 | 7 | 7 | 7 | 13 | 13 | 13 | | | | | |
| 8 | 6 | 6 | 12 | 12 | 12 | | | | | | |
| 9 | 8 | 8 | 8 | 14 | 14 | 14 | | | | | |
| 10 | 5 | 5 | 11 | 11 | 11 | | | | | | |
| 11 | 3 | 9 | 9 | 9 | 15 | 15 | 15 | | | | |
| 12 | 4 | 10 | 10 | 10 | 16 | 16 | 16 | | | | |
| 13 | | 1 | 1 | 1 | 7 | 7 | 7 | 13 | 13 | 13 | |
| 14 | | | | 6 | 6 | 6 | 12 | 12 | 12 | | |
| 15 | | 2 | 2 | 2 | 8 | 8 | 8 | 14 | 14 | 14 | |
| 16 | | | | 5 | 5 | 5 | 11 | 11 | 11 | | |
| 17 | | | 3 | 3 | 3 | 9 | 9 | 9 | 15 | 15 | 15 |
| 18 | | | 4 | 4 | 4 | 10 | 10 | 10 | 16 | 16 | 16 |

FIG.2h



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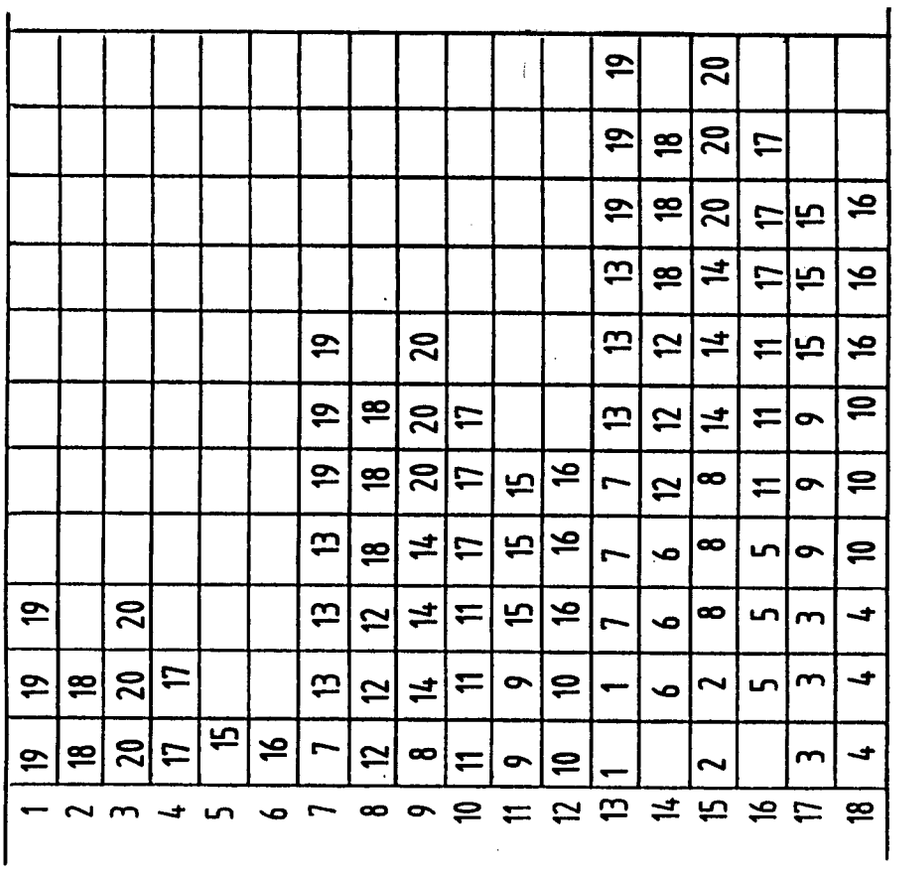


FIG.2j

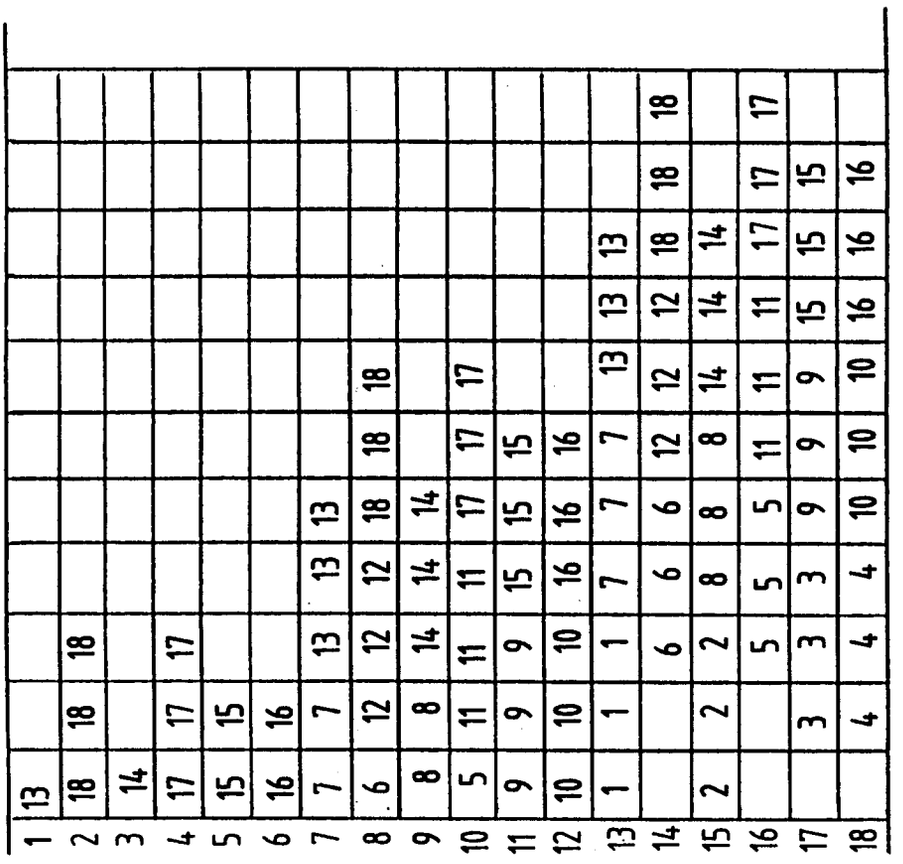
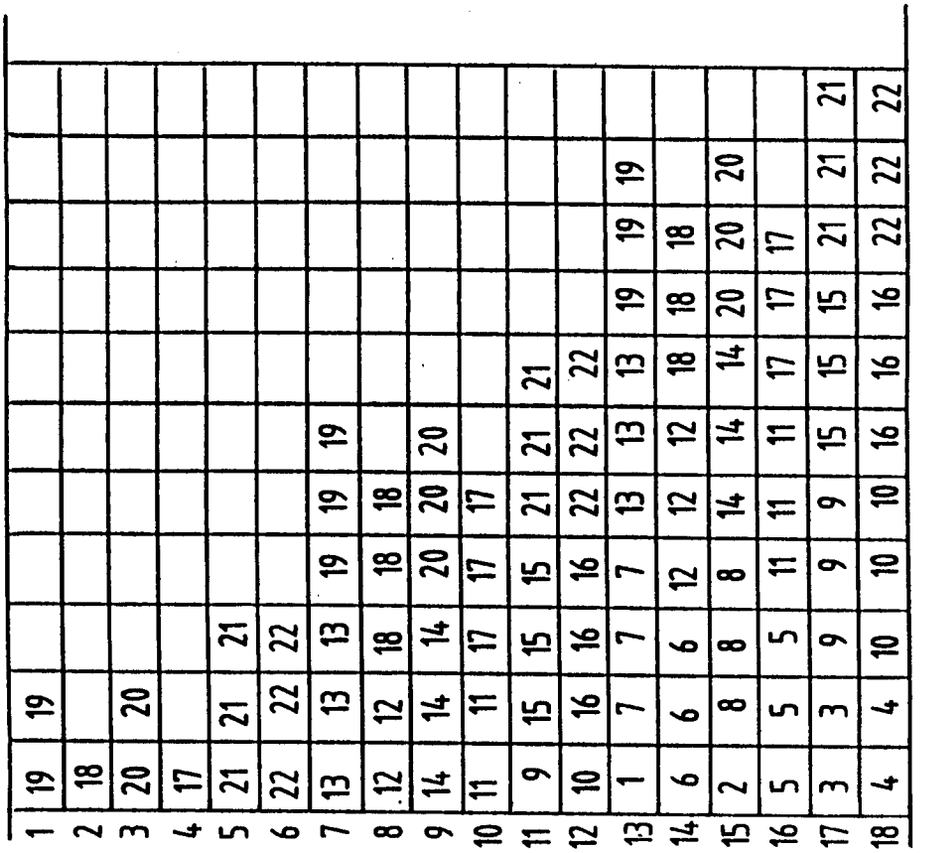


FIG.2i



| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 19 | 19 | | | | | | | | | |
| 2 | 18 | | | | | | | | | | |
| 3 | 20 | 20 | | | | | | | | | |
| 4 | 17 | | | | | | | | | | |
| 5 | 21 | 21 | 21 | | | | | | | | |
| 6 | 22 | 22 | 22 | | | | | | | | |
| 7 | 13 | 13 | 13 | 19 | 19 | 19 | | | | | |
| 8 | 12 | 12 | 18 | 18 | 18 | | | | | | |
| 9 | 14 | 14 | 14 | 20 | 20 | 20 | | | | | |
| 10 | 11 | 11 | 17 | 17 | 17 | | | | | | |
| 11 | 9 | 15 | 15 | 15 | 21 | 21 | 21 | | | | |
| 12 | 10 | 16 | 16 | 16 | 22 | 22 | 22 | | | | |
| 13 | 1 | 7 | 7 | 7 | 13 | 13 | 13 | 19 | 19 | 19 | |
| 14 | 6 | 6 | 6 | 12 | 12 | 12 | 18 | 18 | 18 | | |
| 15 | 2 | 8 | 8 | 8 | 14 | 14 | 14 | 20 | 20 | 20 | |
| 16 | 5 | 5 | 5 | 11 | 11 | 11 | 17 | 17 | 17 | | |
| 17 | 3 | 3 | 9 | 9 | 9 | 15 | 15 | 15 | 21 | 21 | 21 |
| 18 | 4 | 4 | 10 | 10 | 10 | 16 | 16 | 16 | 22 | 22 | 22 |

FIG.2k

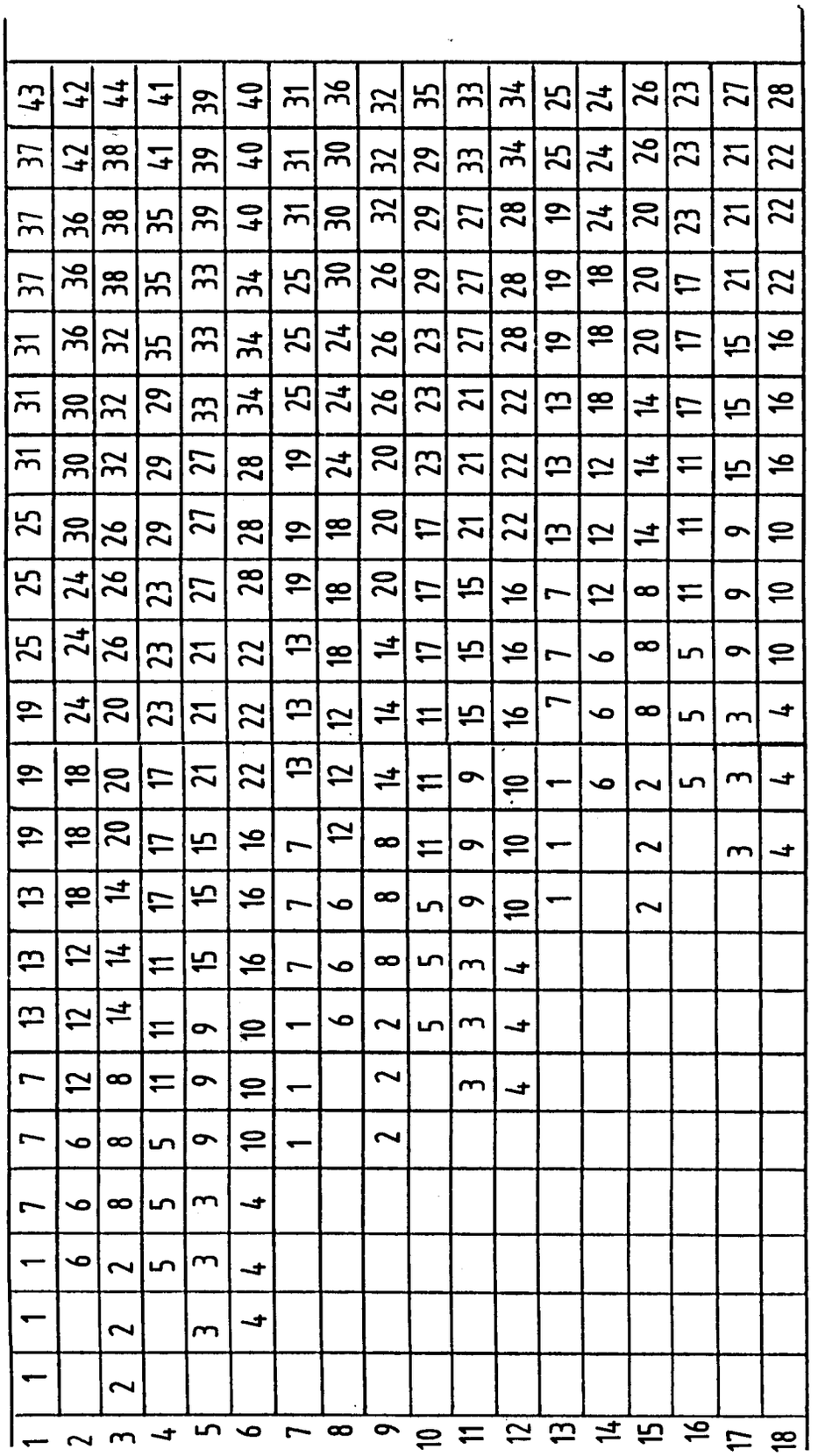


FIG.3

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 95 20 2656

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| A | DE-B-11 88 013 (WERNER & PFLEIDERER) 4 March 1965<br>* the whole document * | 1-3,5-7 | B28B13/02<br>B28B5/02 |
| A | US-A-3 106 280 (D. K. BAKER) 8 October 1963<br>* the whole document * | 1-3,5-7 | |
| A | EP-A-0 408 149 (HUBERT SNEEK MACHINEFABRIEK B.V.) 16 January 1991<br>* the whole document * | 1 | |
| A | DATABASE WPI<br>Week 7721 16 May 1977<br>Derwent Publications Ltd., London, GB;<br>AN 77-E2317Y<br>& NL-A-7 603 794 (MACHINEFABRIEK MATTIJSSEN B.V.) , 11 October 1977 | 1 | |

| TECHNICAL FIELDS SEARCHED (Int.Cl.6) |
|---|
| B28B<br>A21C |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 23 January 1996 | Gourier, P |

CATEGORY OF CITED DOCUMENTS

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