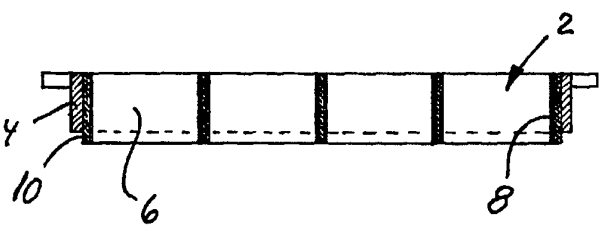




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : B28B 7/24	A1	(11) International Publication Number: WO 95/18703 (43) International Publication Date: 13 July 1995 (13.07.95)
(21) International Application Number: PCT/DK95/00007 (22) International Filing Date: 6 January 1995 (06.01.95) (30) Priority Data: 0034/94 7 January 1994 (07.01.94) DK (71) Applicant (for all designated States except US): MASKIN INDUSTRI VIBORG A/S [DK/DK]; Noerre Langgade 38, DK-8840 Roedkaersbro (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): GREGERSEN, Agner, Rask [DK/DK]; Mellemhoejen 2, DK-8800 Viborg (DK). (74) Agent: GREGERSEN, N., H.; Aarhus Patentkontor, Skander- borgvej 40, DK-8000 Aarhus C (DK).		(81) Designated States: AT, AU, BG, BR, CA, CH, CN, CZ, DE, DE (Utility model), DK, DK (Utility model), EE, ES, FI, FI (Utility model), GB, GE, HU, JP, KP, KR, LT, LU, LV, MX, NL, NO, NZ, PL, PT, RO, RU, SE, SI, SK, UA, US, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>In English translation (filed in Danish).</i>
(54) Title: A MOULD  (57) Abstract A mould for use by the production of concrete items, for instance pavement stones, and comprising a mould part (2) with a number of preferably uniform mould cavities (6), which mould part (2) is adapted to be placed on a vibration table for filling in the casting material by means of a filling carriage or filling sledge, whereafter the concrete items are formed on a supporting plate by lifting off the mould part, said mould cavities (6) consist of individual mould boxes (8) preferably made from thin metal plate, and which preferably are positioned with mutual uniform distance in a mould frame (4) and secured by casting thereto by means of moulding material (10) consisting of or containing elastic material, for instance rubber.		

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A Mould

The present invention relates to a mould of the type described in the introductory clause of claim 1.

Moulds for the production of relatively simple concrete items - for instance pavement stones, which are produced in large numbers - are usually adapted for use in automatic or semi-automatic casting machinery. Normally moulds of this type are adapted to simultaneous production of a large number of pavement stones, for instance a whole pallet layer of pavement stones, which possibly also may be intended for machine laying.

10

Moulds of said type are rather expensive to produce, and their life is relative short because of large wear. The proper mould part, that is that part of the mould, which is provided with mould cavities corresponding to the outer shape of the concrete item, may be produced in several manners, namely either by flame cutting of the individual mould cavity in a solid steel plate with a thickness equal to the thickness or height of the concrete items - or by moulding in a suitable mould material, also with a thickness of the mould equal to the thickness or height of the concrete items. Furthermore it is known to produce the mould part by welding.

20 By producing of the concrete moulds of this type another factor is of great importance - namely the factor of time, because there is a relatively long time of delivery of new moulds, which among others is due to the fact that several working processes often are involved, and that the actual manufacturing of moulds often demands expert work, for instance for the subsequent treatment such as hardening of moulds, etc. Therefore
25 hitches, where the mould is damaged, may cause rather big working deficit - exactly because of the long time of delivery. Furthermore it is problematic to obtain sufficient accuracy.

The purpose of the invention is to provide a mould of the type mentioned in the introductory part, and which by simple provisions may result in a considerable relaxation in the production and a considerable reduction of the price of moulds of said type.

- 5 The mould according to the invention is distinctive in that said mould cavities consist of individual mould boxes which preferably are made from thin metal plate, and which preferably are positioned with mutual uniform distance in a mould frame and secured by casting thereto for forming said mould part. By means of simple provisions a considerable relaxation in the production and a considerable reduction of the price of moulds of
- 10 said type hereby may be obtained. Furthermore the total weight of the mould may be considerably reduced, which again means, that no unnecessary energy is used in connection with vibration of the mould by the casting operation. The individual mould boxes, which may be produced in an effective and cheap manner, may be stocked in a large number, so that the time of delivery in connection with the mould production itself
- 15 may be reduced considerably, as the mould boxes in the wanted shape quickly may be placed and secured by casting in a standard mould frame.

In order to make the mould lighter and more noise-filtered this is according to the invention such provided, that said mould boxes are secured by casting in the mould

20 frame by means of a moulding material consisting of or containing elastic material so that the mould boxes to some extent are mutually movable.

Preferably the mould is such provided, that said mould boxes are secured by casting in the mould frame by means of a moulding material consisting of or containing rubber, so

25 that the mould boxes to some extent are mutually movable.

To make the vibration casting method more effective the mould according to the invention may advantageously be such provided that said mould boxes are secured by casting in the mould frame in such a manner, that mould boxes and possible moulding

30 material downward project outside the mould frame, that is that mould boxes or mould cavities individually may be in touch with the vibration table or supporting plate,

respectively - at the same time the surrounding casting material have a sound-absorbing effect.

The invention is described in more details in the following, reference being made to the
5 accompanying drawing, in which:-

Fig. 1 shows a plane view of an embodiment for a mould part for a mould according to the invention - seen from above,

10 Fig. 2 shows an embodiment for a mould box to the mould part shown in Fig. 1,

Fig. 3 shows a sectional view of the mould part, cf. III - III in Fig. 1,

Fig. 4 shows a plane view of another embodiment for a mould part, which may be
15 produced according to the invention,

Fig. 5 shows a plane view of a further embodiment for a mould part, which may be produced according to the invention, and

20 Fig. 6 shows a plane view of a still further embodiment for a mould part, which may be produced according to the invention.

The mould part 2 to a mould shown in Figs. 1 - 3 according to the invention consists of a mould frame 4 with a number of mould cavities 6, which are formed by loose mould
25 boxes 8 (Fig. 2). These boxes are positioned as shown in the mould frame 4, before the form boxes 8 are secured by casting in the mould frame by means of a moulding material 10 consisting of or containing rubber. As shown in Fig. 3 the mould boxes 8 and the moulding material 10 project a little below the mould frame 4, that is that the mould boxes 8 individually may be supported on the vibration table and supporting
30 plate, respectively, of the mould machine - at the same time the mould part 2 is noise-filtered by means of the fact that the moulding material 10 surround the mould boxes 8.

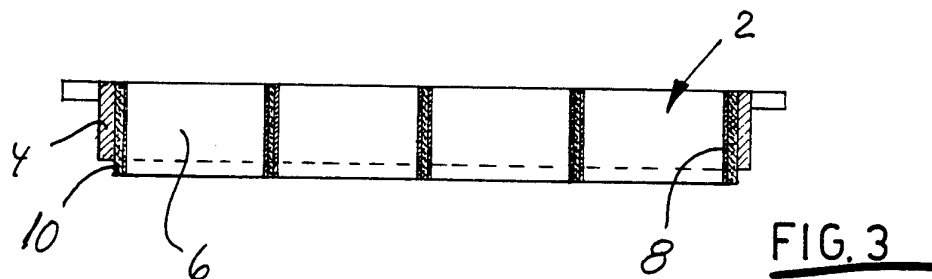
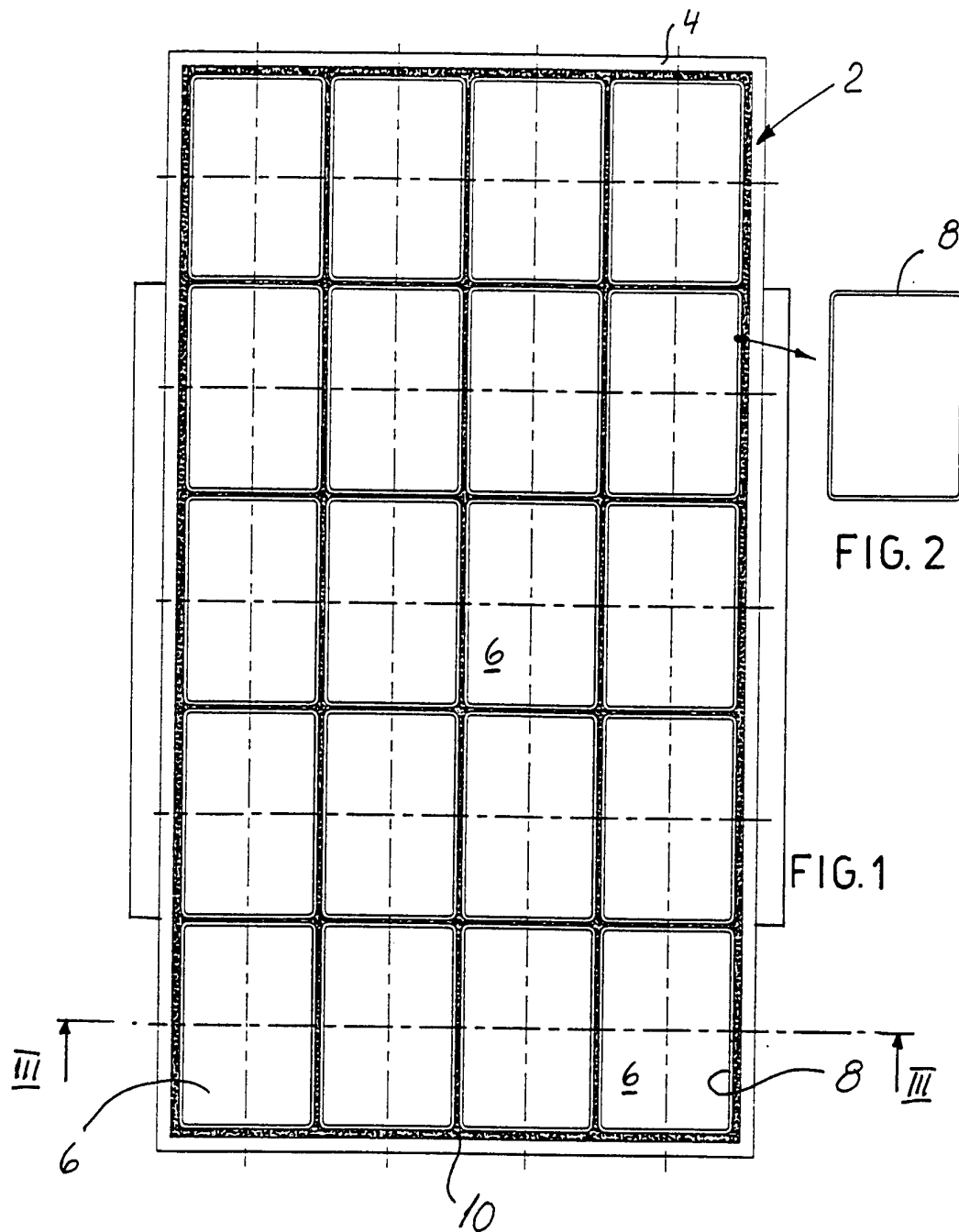
The mould boxes 8 are made from thin steel plate, which after rolling and welding, and possible mould pressing of side projectings preferably are hardened, which may result in a general longer life of the mould. The mould boxes 8 are rather cheap to produce, why they may be stocked in large numbers and variants, that is that the time of delivery
5 of the moulds may be reduced considerably, as it is possible rather quickly to secure by casting the wanted mould boxes in a mould frame, which also are stock goods.

In Figs. 4 - 6 mould parts are shown, which in a similar manner may be constructed by loose mould boxes, which are positioned and secured by casting in mould frames by
10 means of suitable moulding materiale preferably consisting of or containing rubber.

CLAIMS

1. A mould for use by the production of concrete items, for instance pavement stones, and comprising a mould part with a number of preferably uniform mould cavities, which mould part is adapted to be placed on a vibration table for filling in the casting material by means of a filling carriage or filling sledge, whereafter the concrete items
5 are formed on a supporting plate by lifting off the mould part, *characterized* in that said mould cavities consist of individual mould boxes which preferably are made from thin metal plate, and which preferably are positioned with mutual uniform distance in a mould frame and secured by casting thereto for forming said mould part.
- 10 2. A mould according to claim 1, *characterized* in that said mould boxes are secured by casting in the mould frame by means of a moulding material consisting of or containing elastic material so that the mould boxes to some extent are mutually movable.
- 15 3. A mould according to claim 1, *characterized* in that said mould boxes are secured by casting in the mould frame by means of a moulding material consisting of or containing rubber, so that the mould boxes to some extent are mutually movable.
4. A mould in accordance to claims 1 - 3, *characterized* in that said mould
20 boxes are secured by casting in the mould frame in such a manner, that mould boxes and possible moulding material downward project outside the mould frame.

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2/2

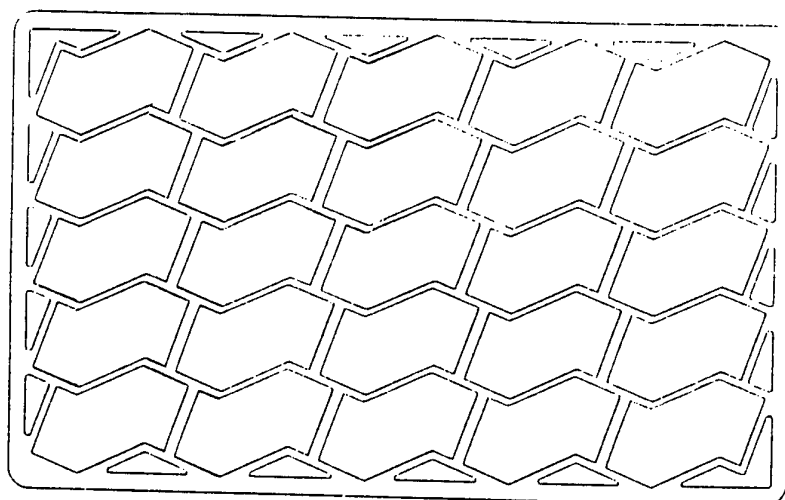


FIG. 4

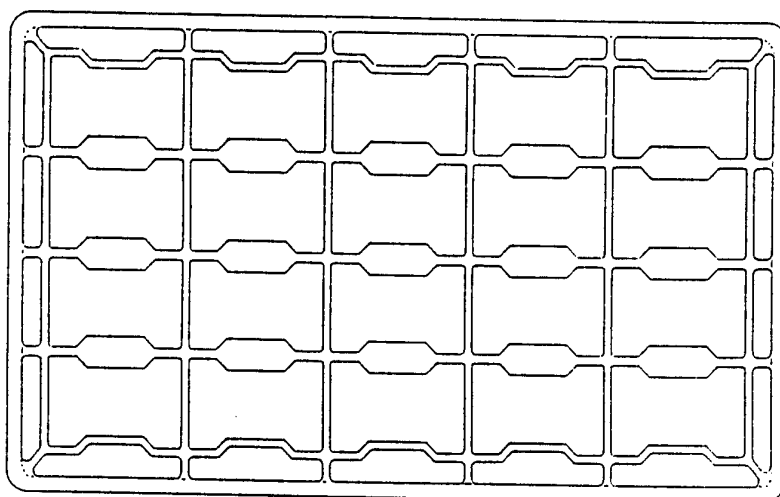


FIG. 5

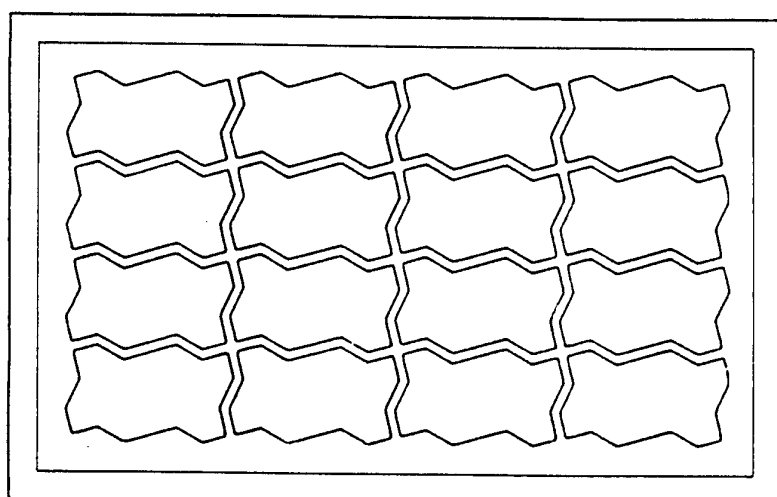


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 95/00007

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B28B 7/24

According to International Patent Classification (IPC) or to both national classification and IPC

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE, A1, 2710643 (SEILER, HERMANN), 14 Sept 1978 (14.09.78), figure 1, detail 4 --	1-4
A	DE, A1, 2934838 (RUEGNER, GEORGES), 19 March 1981 (19.03.81), figure 1, detail 2 --	1-4
A	US, A, 848955 (G.L. BARTLETT), 2 April 1907 (02.04.07), page 2, line 17 - line 31, figure 1, details 13,14 --	1-4

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

14 March 1995

Date of mailing of the international search report

27 -04- 1995

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Patent Abstracts of Japan, Vol 13, No 365, M-859, abstract of JP, A, 1-122407 (OSAKA GAS CO LTD), 15 May 1989 (15.05.89), details 7,8 -- -----	1-4

INTERNATIONAL SEARCH REPORT

Information on patent family members

09/02/95

International application No.

PCT/DK 95/00007

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A1- 2710643	14/09/78	NONE	
DE-A1- 2934838	19/03/81	NONE	
US-A- 848955	02/04/07	NONE	