

Machine translation



# FEDERAL SUPREME COURT

## ON BEHALF OF THE PEOPLE

### JUDGMENT

X ZR 137/22

Published on:  
February 11, 2025  
Anderer  
Clerk of the court as  
clerk of the court  
registry

in the patent nullity case

Reference book:     yes  
BGHZ:                no  
BGHR:                yes  
JNEU:                yes

Moisture and ash analysis

EPC Art. 56; PatG § 4

The indication that a device disclosed in the prior art can be combined with a certain type of apparatus does not automatically imply that the device can be combined with any such apparatus.

Federal Supreme Court (BGH), judgment of February 11, 2025 - X ZR 137/22 -  
Federal Patent Court

ECLI:DE:BGH:2025:110225UXZR137.22.0

The X. Civil Senate of the Federal Supreme Court ruled at the hearing on February 11, 2025 by the presiding judge Dr. Bacher, the judges Hoffmann, Dr. Deichfuß and Dr. Rensen and the judge Dr. von Pückler:

The appeal against the judgment of the 5th Senate (Nullity Senate) of the Federal Patent Court of July 7, 2022 is dismissed at the plaintiff's expense.

By law

### Facts

1 The defendant is the proprietor of European patent 1 455 175, filed on March 6, 2003 and granted with effect for the Federal Republic of Germany, which relates to an analytical device for moisture or ash in mixed samples. Patent claim 1, to which five further patent claims are related back, reads in procedural language:

Apparatus for moisture or ash analysis of the kind comprising a furnace (10), a balance (21) having weighing platform (112) positioned in said furnace (10), support means (201) for supporting a plurality of crucibles (9) in a generally horizontal circular configuration, each of the crucibles (9) holding a sample of material to be analyzed, means (3) for automatically placing and removing crucibles (9) into said support means (201), rotation means (16) for rotating said support means (201) sequentially and vertically aligning a crucible (9) with the means (3) for automatically placing and removing the crucibles (9) on the support means (201), elevation means for vertically shifting said support means (201) to deposit and remove the aligned crucibles (9) on and off of said weighing platform (112) and control means (300) for controlling said rotation means (16) and said elevation means to allow insertion of the crucibles (9) by the means (3) for automatically placing and removing the crucibles (9) characterized in that the furnace (10) has a hole (41) on its top surface (42) adapted to allow the placing and removing of the crucibles through said hole, the furnace (10) thereby remaining substantially closed during the placing and removing of the crucibles (9) by the placing and removing means (3).

In earlier nullity proceedings, the Senate declared the patent in suit null and void with effect for the territory of the Federal Republic of Germany insofar as claim 1 goes beyond a version in which it initially states: "Apparatus for moisture and ash analysis", and the other claims are related back to the claim thus formulated, and otherwise dismissed the nullity action (Federal Supreme Court BGH, judgment of September 5, 2017 - X ZR 85/15).

2 The plaintiff, who is claimed under the patent in suit, argues that the invention is not disclosed in such a way that a skilled person can carry it out and that the subject-matter of the patent in suit is not patentable. The defendant has defended the patent in suit in the version it received in the first nullity proceeding.

3           The Patent Court dismissed the complaint. The plaintiff appeals against this  
decision and continues to pursue its request at first instance. The defendant  
opposes the appeal.

#### Reasons for the decision

4           The plaintiff's appeal is admissible but unfounded.

5           I.       The patent in suit relates to a device for moisture or ash analysis.

6           1.       According to the specifications in the patent in suit, such devices are  
used to analyze samples.

7           For this purpose, crucibles used to hold the samples are first weighed outside  
the furnace, both when empty and after being filled with the sample, and then  
placed on a plate or turntable in a furnace chamber containing a weighing  
platform. The samples are then heated in the furnace and weighed at specific  
times. The moisture or ash content is determined by weighing at the beginning  
and end of the process.

8           The patent in suit describes various devices known in the prior art. These are  
each designed in such a way that the door of the furnace chamber has to be  
opened in order to place the crucibles on the plate or the turntable or to remove  
them. In the case of the device known from US patent 4 522 788, it is necessary  
to cool the furnace down to 600°C before opening.

9           The patent in suit also refers to US patents 5 064 009, 5 382 884 and 4 952 108.  
These devices have the disadvantage that loading the furnace requires the furnace  
door to be opened, which causes heat to be lost.

10           2.     Against this background, the technical problem is to provide a device for moisture and ash analysis that is simple and safe to operate, versatile and uses the energy input efficiently.

11           3.     To solve this problem, the patent in suit in claim 1 of the version in force proposes a device whose features can be organized as follows:

Apparatus for moisture and ash analysis, comprising

1. a furnace (10);
2. a balance (21) having a weighing platform (112) positioned in said furnace (10);
3. support means (201) for supporting a plurality of crucibles (9) in a generally horizontal circular configuration;
4. crucibles (9), each holding a sample of material to be analyzed;
5. means (3) for automatically placing the crucibles (9) into and removing them from the support means (201);
6. rotation means (16) for
  - a) the sequential rotation of the support means (201) and
  - b) the vertically alignment of the crucibles (9) with the means (3) for automatically placing the crucibles into and removing them from the support means (201);
7. lifting means for vertically moving the support means (201) in order to place the aligned crucibles (9) on the weighing platform (112) and remove them therefrom;
8. control means (300) for controlling the rotating means (16) and the elevating means to allow the insertion of crucibles (9) by the means (3), wherein
9. a hole is formed on the top surface of the furnace (41) through which the crucibles can be placed and removed, whereby the furnace remains substantially closed during this placing and removing of the crucibles by the means (3).

12 4. Some features require explanation:

13 a) According to feature 2, the device comprises a balance including a  
weighing platform which is arranged in the furnace. This linguistically ambiguous  
formulation is to be understood as meaning that only the weighing platform must  
be arranged in the furnace, whereas the balance may be located outside the  
furnace.

14 This is due to the fact that the balance - unlike the weighing platform - is  
sensitive to temperature fluctuations.

15 b) According to feature 3, the device comprises support means to hold a  
plurality of crucibles in a generally horizontal circular arrangement.

16 These support means are located inside the furnace, as can be seen from the  
context of the other features.

17 c) According to feature 4, the crucibles each contain a sample of material to  
be analyzed.

18 As the description explains, the crucibles are first weighed outside the  
furnace before and after being filled with the material sample (para. 12), before  
being placed in the furnace.

19 d) The furnace is loaded in accordance with feature 5 by means for  
automatically inserting the crucibles into and removing them from the support  
means.

20 e) According to feature 9, the furnace has a hole at its top through the  
crucibles can be inserted and removed.

21 This means that the furnace door does not have to be opened to load the  
furnace with crucibles, so that the furnace can remain closed except for the hole  
during the loading process.

22 f) Claim 1 does not contain any explicit information on the size of the  
hole.

23 However, it can be seen from feature 9 that the hole must be designed in such  
a way that the furnace can be automatically loaded with crucibles, but must not  
be larger than necessary to limit the energy loss associated with it.

24 The description, according to which the crucibles are inserted into a small  
opening in the upper surface of the furnace chamber, also points in this direction  
(see para. 12: "The robotic arm retrieves each crucible from the conveyor, inserts  
it into a small opening in the upper surface of the furnace chamber").

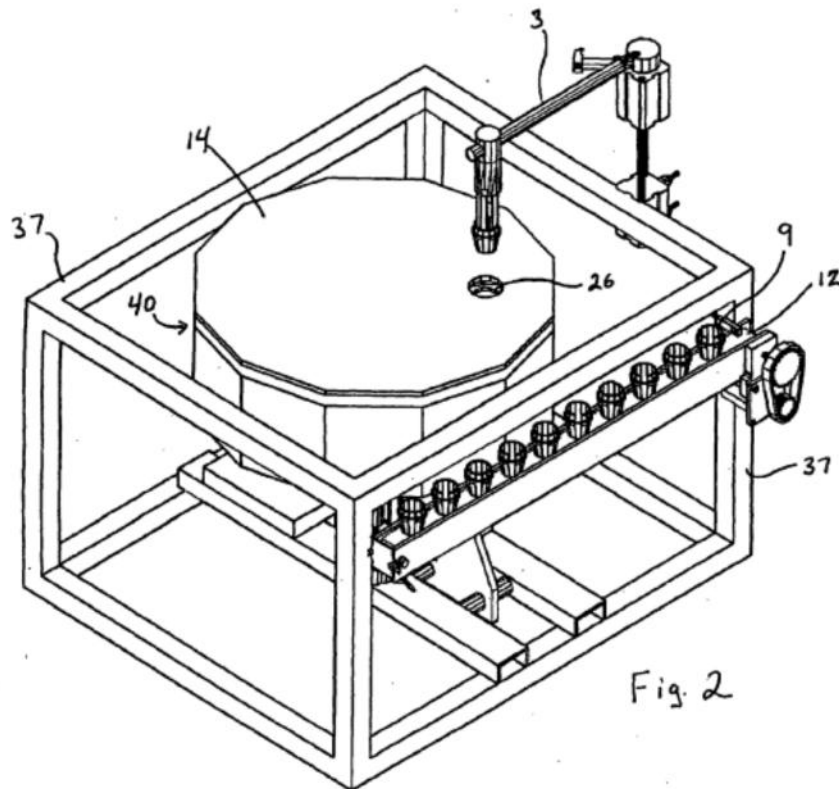
25 g) The patent in suit does not specify whether the furnace must have an  
oven door or whether this is dispensable. Thus, both possibilities are covered by  
the subject matter of the patent in suit.

26 The decisive factor is that the furnace can be loaded without the furnace door  
having to be opened and closed. The patent in suit is based on the fact that  
opening the furnace door is associated with a large opening of the furnace  
chamber and thus with a considerable loss of energy, whereas the furnace  
according to the invention has an opening on its upper side, but the furnace door  
can remain closed even when the furnace is being loaded.

27 Because it has a hole at the top, the furnace is not completely sealed, but only  
"essentially" sealed. This means that a certain amount of energy loss is accepted.  
However, this state can also be maintained during charging. On the other hand,  
the patent in dispute does not exclude the possibility of the hole being closed  
outside the charging process.

28 h) According to feature group 6, the device comprises rotating means for sequentially rotating the support means and vertically aligning the crucibles with the means for automatically loading the device referred to in feature 5.

29 aa) As can be seen from Figures 2 to 4 of the patent in suit, reproduced below, this makes it possible to rotate the support means and to stop them in certain positions in such a way that the crucibles or the openings of the support means serving to receive crucibles are aligned vertically when the furnace is stationary in such a way that automatic loading through the hole arranged at the top of the furnace is possible.



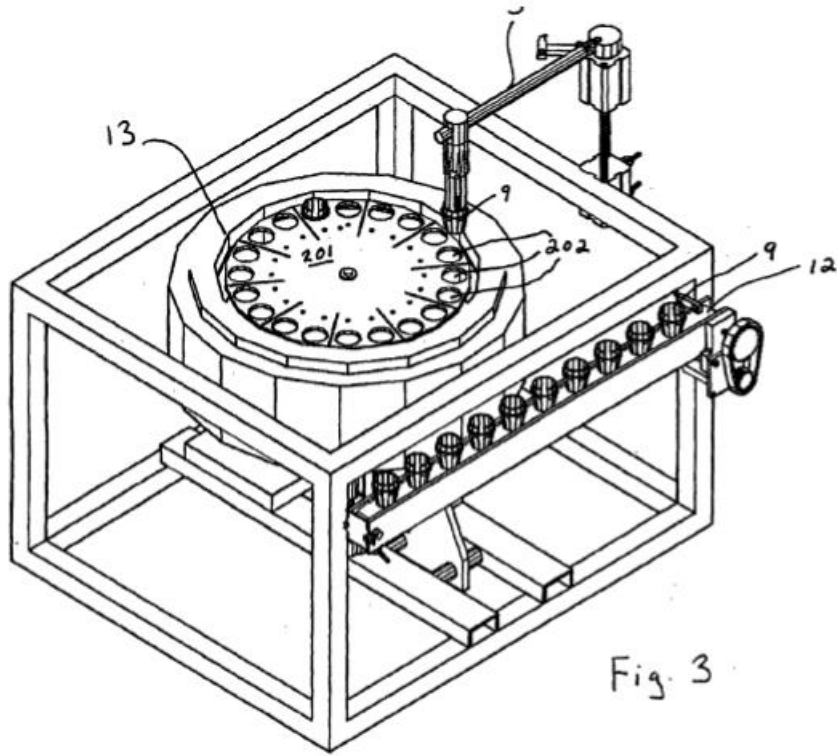


Fig. 3

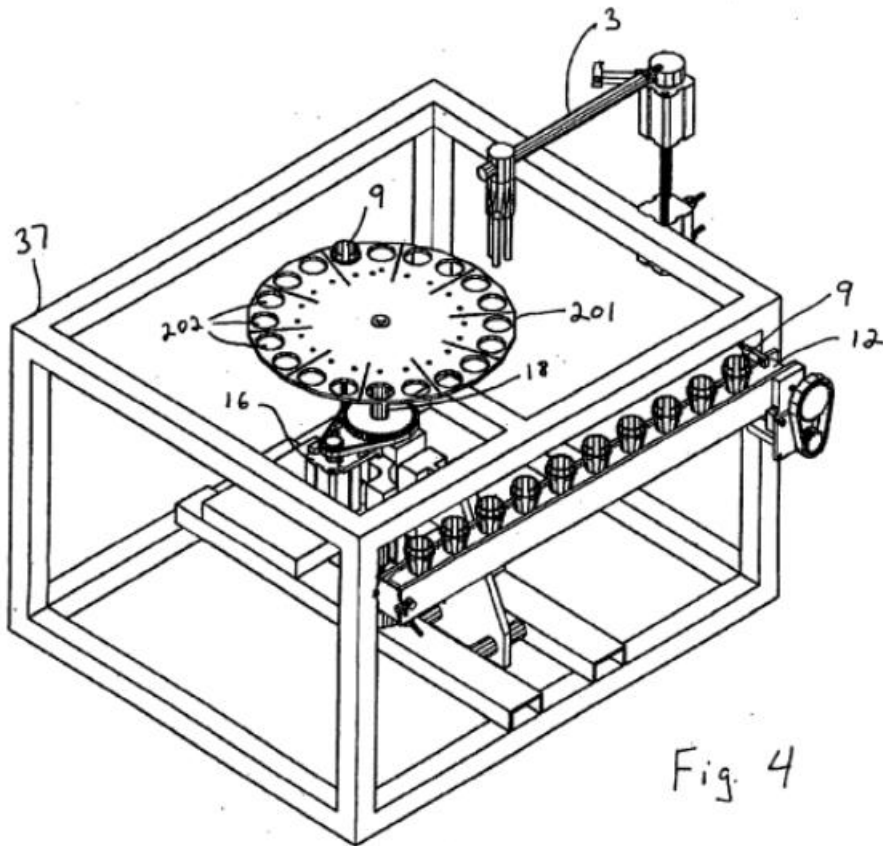
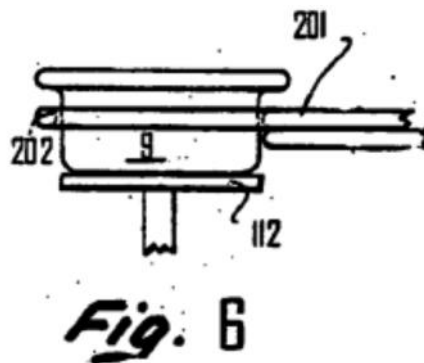
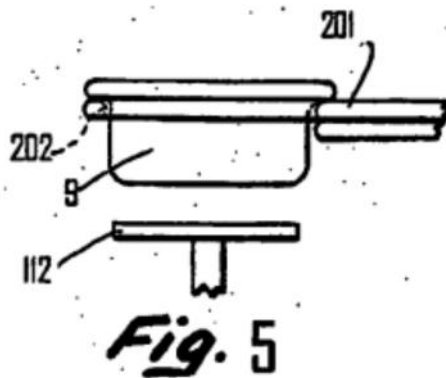


Fig. 4

30           bb) As is apparent from the context of feature 7, the rotating means also  
serve to rotate the support means so that individual crucibles are arranged above  
the weighing platform mounted inside the furnace.

31           In conjunction with the lifting means according to feature 7, this enables the  
crucibles to be positioned above the weighing platform, placed on it for weighing  
and then lifted again.

32           This procedure is shown by way of example in Figures 5 to 7 below.



33

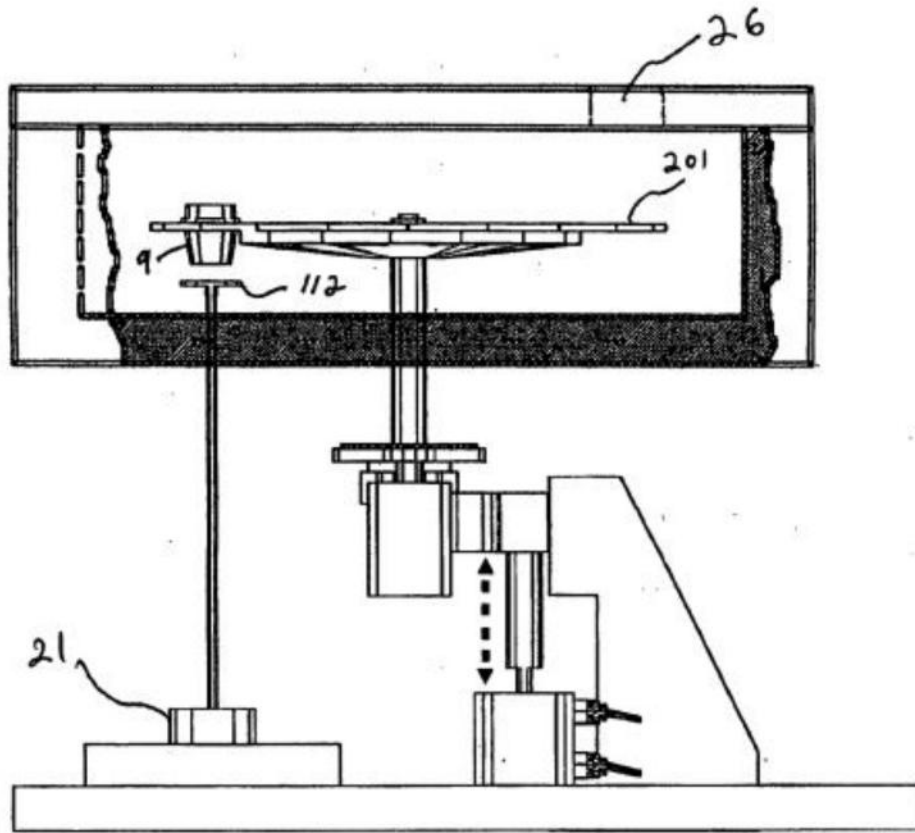


FIG. 7

i) The rotating means provided in feature group 6 are controlled by control means (300) according to feature 8.

34

According to the description, a computer can be used as a means of control (paras. 17, 18, 20).

35

j) The question of whether it is sufficient for feature 8 to be realized that rotating means and control means are present which are suitable in the abstract to align the crucibles with means for automatic insertion and removal and thus enable the insertion of crucibles, or whether this also requires that the rotating means can be controlled in the corresponding manner without reprogramming or other configuration measures (cf. Federal Supreme Court (BGH), judgment of January

11, 2022 - X ZR 4/20, GRUR 2022, 982 para. 53 f. - SRS-Zuordnung), is not relevant for the decision on the legal status.

36 II. The Patent Court essentially gave the following reasons for its decision:

37 The invention is so clearly and completely disclosed in the patent in suit that a skilled person can carry it out. Although the patent in suit does not contain any more detailed information on the material and design of a robot arm for feeding the furnace, the design of such a robot arm is a familiar routine measure for the skilled person, a graduate engineer (FH) in process engineering or physical measurement technology, who has experience in the field of automated physical analysis of a wide variety of materials, in particular in the field of thermal analysis of raw materials. The design of a robot arm and its adaptation to the task to be performed is part of the general technical knowledge, as evidenced, for example, by US patent specification 6 203 760 (N2) and German patent 38 05 321 (N4).

38 The subject-matter of claim 1 is neither anticipated by N2 nor by the Swiss patent application 684 214 (N6). It is also based on inventive step. The German patent specification 33 02 017 (N1) does not disclose any means for automatically charging the furnace with crucibles and thus also no rotating means for aligning the crucibles with such means. Furthermore, it is not known from this document to equip the furnace with a hole on its upper side through which the furnace can be loaded with crucibles. It is true that N2 shows an automated gripper arm with which crucibles can be inserted fully automatically into the furnace chamber through a small opening at the top of a furnace. However, contrary to the plaintiff's view, the skilled person would not readily combine the device shown there with the furnace described in N1. In order to arrive at the subject-matter of claim 1 from this starting point, a whole

series of constructively complex and non-trivially realizable modifications would be required. A different assessment would not result even if N2 or the German patent application 38 14 959 (N3) were to be regarded as the starting point of the skilled person's efforts. None of these publications contained feature 6b.

39           III.     This assessment will stand up to review on appeal.

40           1.     Contrary to the opinion of the appeal, the invention is so clearly and completely disclosed that a skilled person can carry it out.

41           a)     According to the case law of the Federal Supreme Court, disclosure is sufficient for practicability if the skilled person is able, without inventive step and without undue difficulty, to practically realize the teaching of the patent claim on the basis of the overall disclosure of the patent specification in conjunction with the general technical knowledge on the application and priority date in such a way that the desired success is achieved (Federal Supreme Court, judgment of 29 March 2022 - X ZR 16/20, GRUR 2022, 813 para. 64 - Übertragungsleistungssteuerungsverfahren).

42           Contrary to the appeal, it is therefore not important whether the necessary information can be taken from the patent specification in dispute in the sense of "reading along".

43           b)     The Patent Court found that at the time of filing the application it was sufficiently known how a spatial construction and adaptation of a robot arm could be designed to enable crucibles to be inserted into and removed from the furnace operated at temperatures of up to 1100°C.

44 For the reasons for its opinion, the Patent Court pointed out that N2 already describes means for automatically inserting and removing crucibles, for example in a device for thermogravimetric analysis (sp. 4 fig. 2023 and fig. 49-59, sp. 8 fig. 29-43). Although high temperatures can prevail in such a device, there is no specific information in N2 as to which material or which design should be used to take account of the heat stress occurring during these processes.

45 The Patent Court also referred to N4, in which a device is described in which a gripping head, which can hold crucibles with samples, is inserted into a furnace tube and can remain there during the entire combustion process, although temperatures of up to 1100°C occur there (sp. 3 lines 14-21 and lines 44-53). There it is merely stated that it is advantageous to manufacture the gripping head from aluminum oxide.

46 c) The Senate is bound by this finding of the Patent Court pursuant to Section 99 PatG in conjunction with Section 529 (1) No. 1 Code of Civil Procedure (ZPO).

47 The plaintiff does not provide any concrete evidence to cast doubt on the accuracy of this finding.

48 2. The Patent Court also rightly decided that the subject matter of claim 1 is patentable.

49 a) As the Senate has already explained in the first nullity proceedings and as the Patent Court and the parties have also correctly seen, the subject-matter of claim 1 in N1 is not fully disclosed.

50 aa) N1 is identical in content to US patent specification 4 522 788, referred to in paragraph 3 of the patent in suit and present in the first nullity proceedings

as D8, and describes a device for determining the moisture and ash content of fossil fuels.

51 An embodiment example is shown in Figure 1 below.

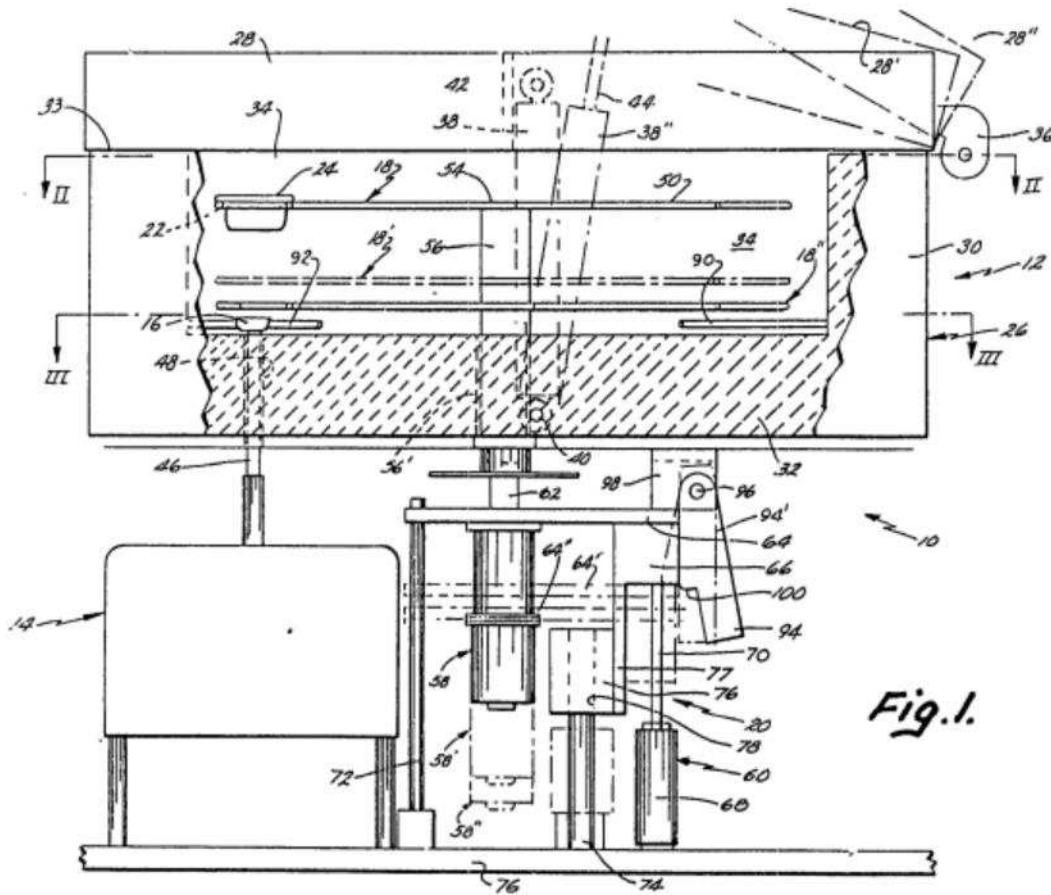


Fig. 1.

52 The device comprises a furnace (12) and a balance (14), the weighing platform (16) of which is arranged inside the furnace chamber (34). A lid (28) with a laterally arranged hinge is located on the top of the oven chamber. This can be pivoted into a loading position (28', sometimes also referred to as the coating position) and into a basically open position (28") (ref. 3 lines 40-47). The furnace chamber also contains a receiving plate (18) which can be rotated sequentially and in which a plurality of crucibles (24) can be arranged horizontally and in a circle (sp. 3 fig. 67

to sp. 4 fig. 14). A lifting device (20) enables the receiving plate to be lowered so that a crucible can be placed on the weighing platform (16) and weighed (sp. 4 lines 15-51). The device is controlled by an electrical control circuit (ref. 6 lines 4-23).

53 To initiate a work cycle, the lid is lifted to the open position (28"). The operator then inserts the required quantity of empty pans. The lid is then closed and the crucibles are weighed one after the other. The crucibles are then moved on to take samples. The lid is lifted to the loading position (28'), whereupon the operator places a sample in the corresponding crucible. The lid is then closed again and the crucible that has just been loaded is immediately weighed in order to achieve the most accurate result possible. The next crucible is then loaded and weighed. A moisture analysis is then carried out, followed by an ash analysis. After each of these steps, the crucibles are weighed again (col. 6 ref. 33 to col. 8 ref. 50).

54 bb) This anticipates features 1 to 4 and 7.

55 cc) The appeal rightly asserts that feature group 6 is also fully disclosed.

56 According to the description of N1, the holding plate can be rotated and stopped sequentially in order to align individual crucibles vertically above the weighing plate mold. This means that the device has rotating means within the meaning of feature group 6, which are also suitable for vertically aligning the crucibles.

57 The fact that N1 does not disclose a control of the rotating means for the purpose of inserting and removing crucibles is irrelevant because, according to feature group 6, the suitability of the rotating means for these purposes is sufficient for the reasons set out above.

58           dd) Whether N1 furthermore anticipates feature 8 is not relevant to the  
decision. As the appeal does not call into question, features 5 and 9 are in any  
case not disclosed in N1.

59           b) The patent court rightly decided that the subject-matter of claim 1 was  
not suggested by N2 on the basis of N1.

60           aa) However, as the Patent Court rightly saw, there was reason to look for  
ways to further automate the process based on N1.

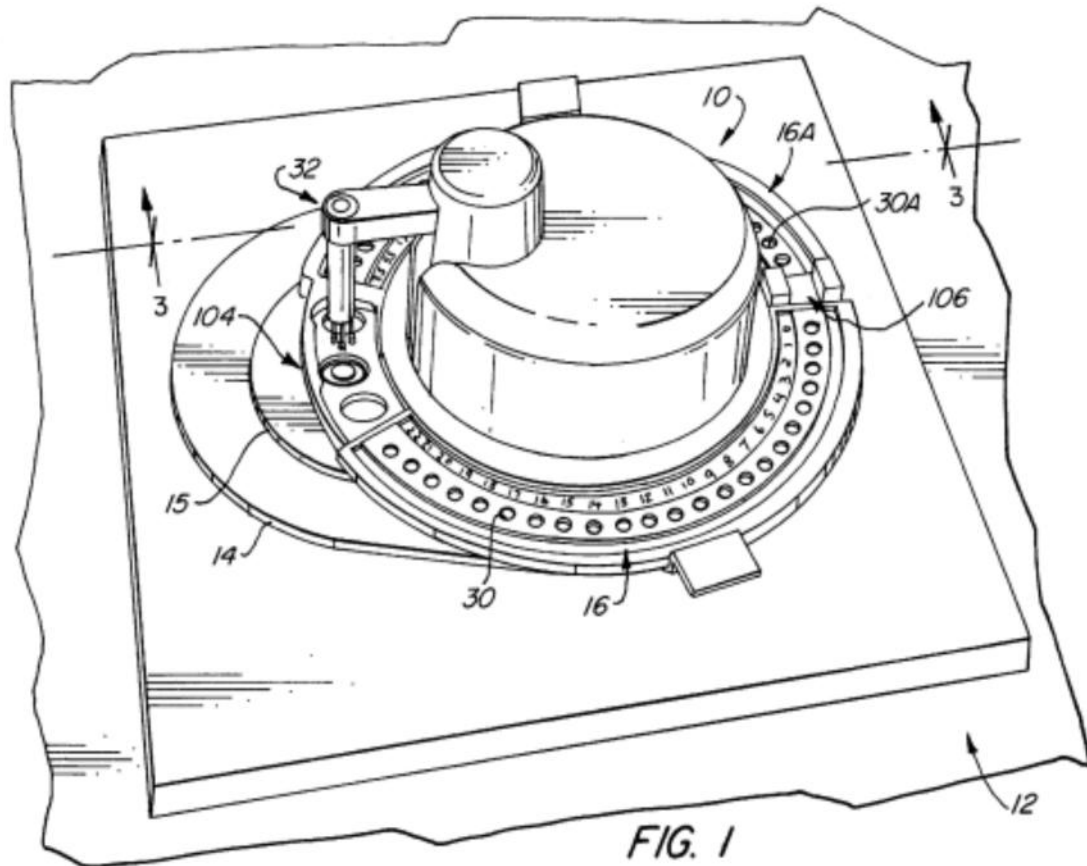
61           N1 points out that it is advantageous if a number of samples can be analyzed  
automatically without having to handle the individual crucibles during the analysis  
cycle. This eliminates the need for an operator to handle the crucibles; at the  
same time, measurement accuracy is improved (ref. 2 lines 23-38).

62           bb) In the search for further possibilities for automation, N2 disclosed a  
feeding device also suitable for devices for determining moisture and ash content.

63           (1) N2 deals with the task of providing an autosampler that can be  
connected to the cover of such a device with little effort and without requiring  
additional space (Sp. 2 lines 7-10).

64           N2 cites devices for dynamic differential scanning calorimetry (DSC) or  
thermogravimetric analysis (TGA) as so-called mother devices with which such a  
sampler can be used. In addition, it is stated that the device is also suitable for  
other analytical devices if adapted accordingly (p. 3, lines 43-55).

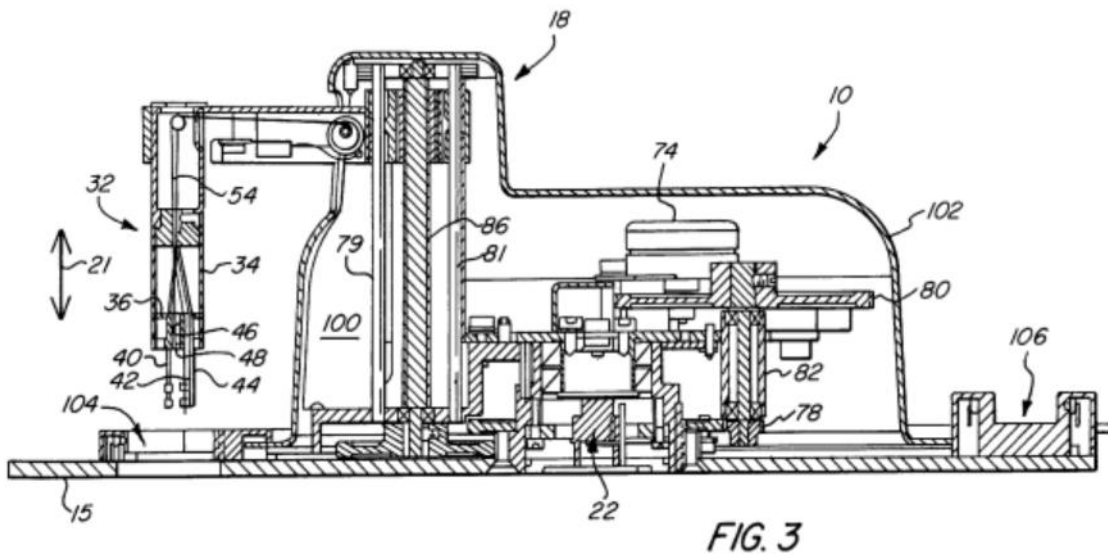
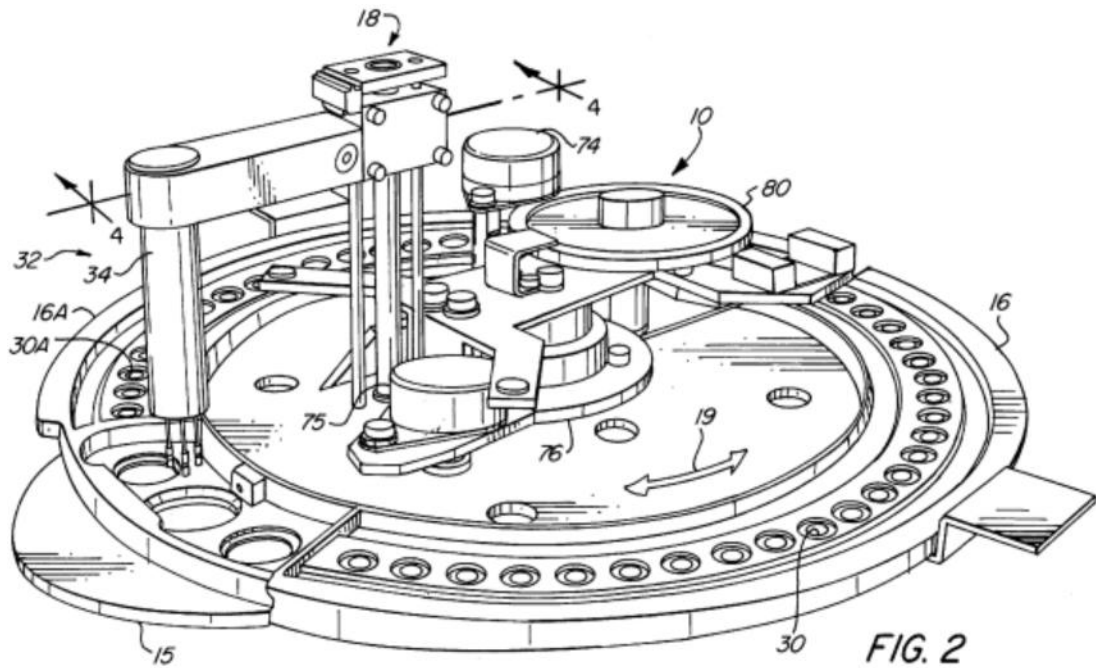
65           (2) N2 provides for the autosampler to be attached to the top of the mother  
device using a base plate (14) and a base plate (15). This is shown in the figure  
below.



66 The base plate (14) has connecting elements for connecting the mother instrument to the device, for example by screwing it on. The base plate (14) also has a furnace access hole (26) through which the crucibles can be inserted into the mother instrument in order to heat them to a predetermined temperature for analysis (sp. 4 lines 14-25).

67 The autosampler comprises one or more trays (16, 16A) into which specimen containers (hereinafter: crucibles) can be inserted.

68 (3) The manipulation device 18, with which the crucibles can be moved, is shown in Figures 2 and 3 reproduced below.



69 As indicated by the double arrow (19) in Figure 2, the device (18) can be pivoted so that it can remove crucibles from the trays (16/16A). The device can also be moved vertically, as indicated by the double arrow (21) in Figure 3. This makes it possible to insert crucibles, which are gripped by the gripper (32), from

the tray into the furnace through the furnace access hole (26) or to remove them from the furnace (ref. 4 lines 47-59).

70 (4) The structure and mode of operation of the device (18) are shown by way of example in Figures 4, 4A and 4B reproduced below.

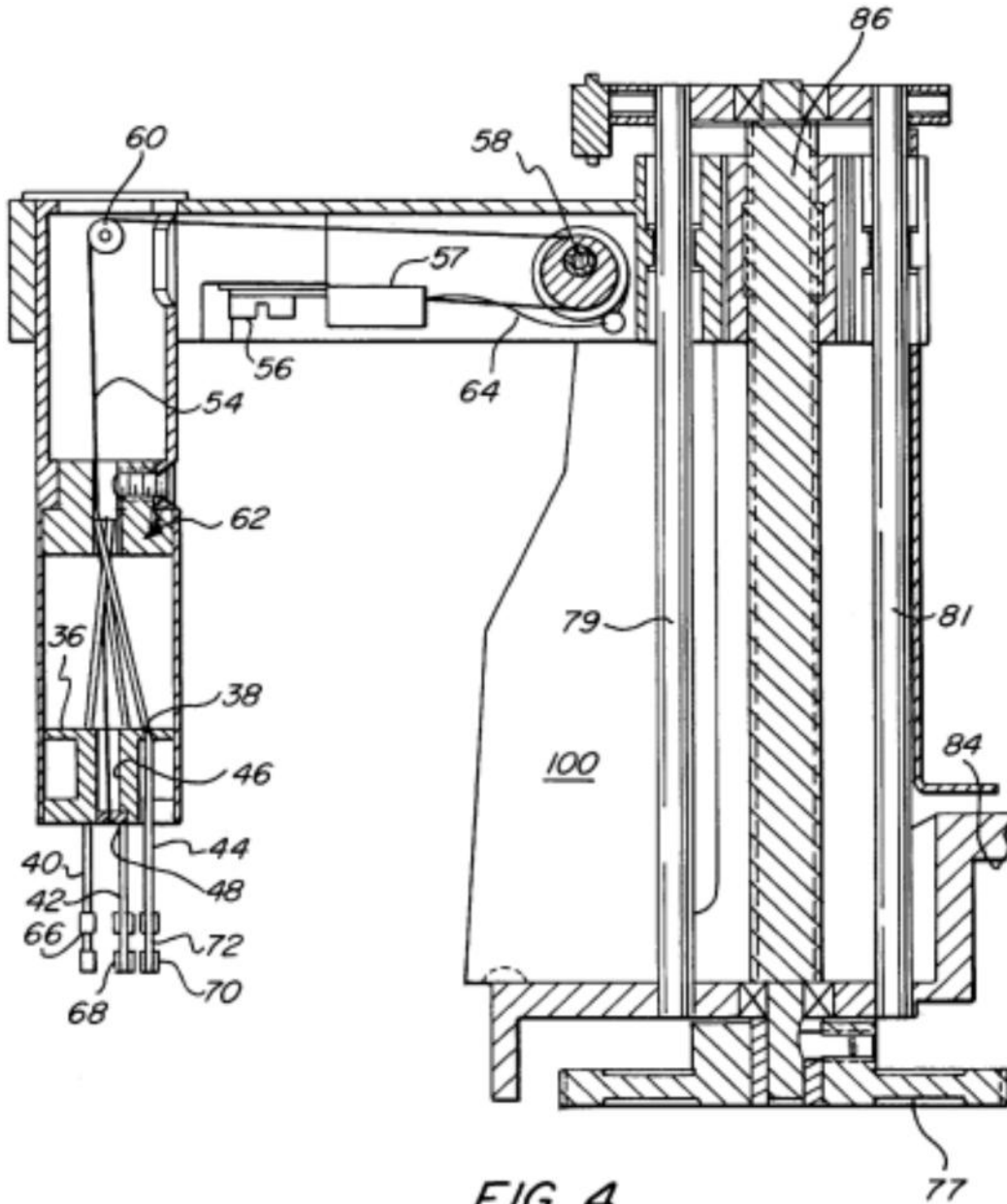
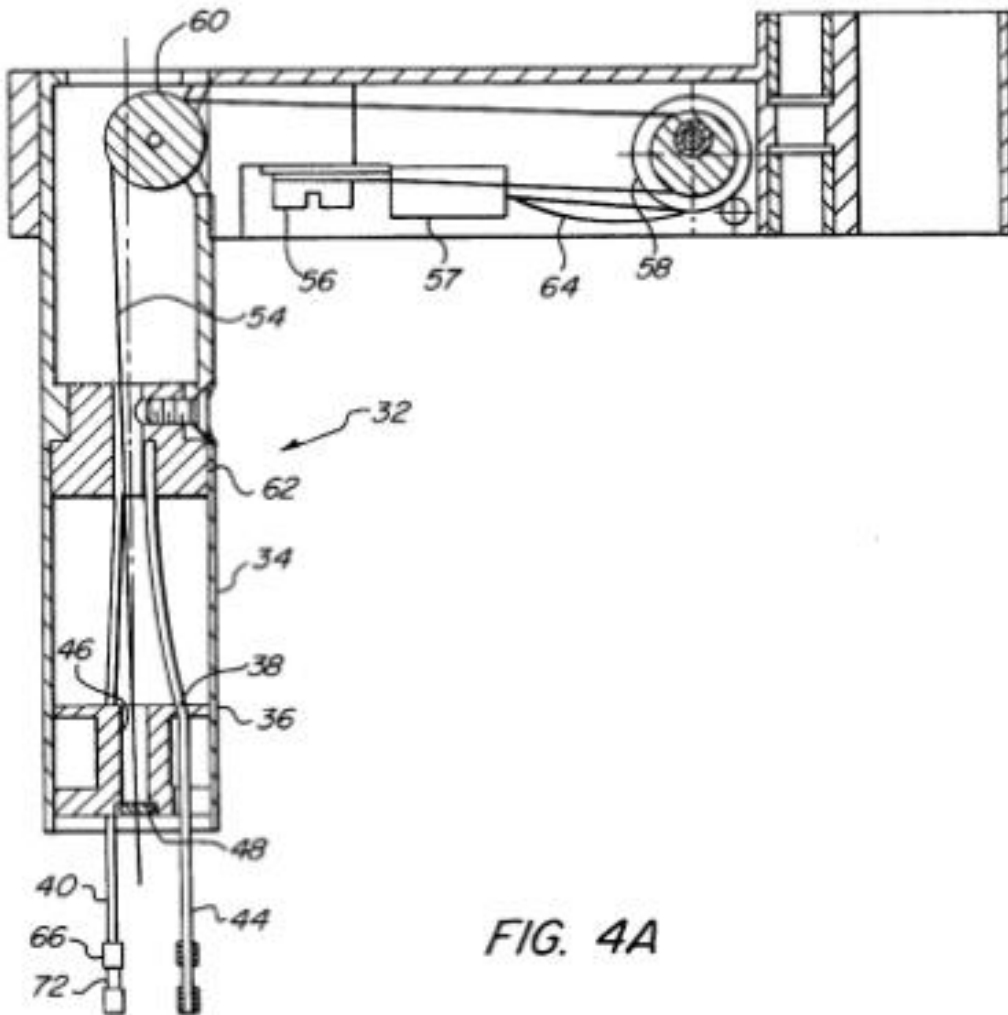


FIG. 4



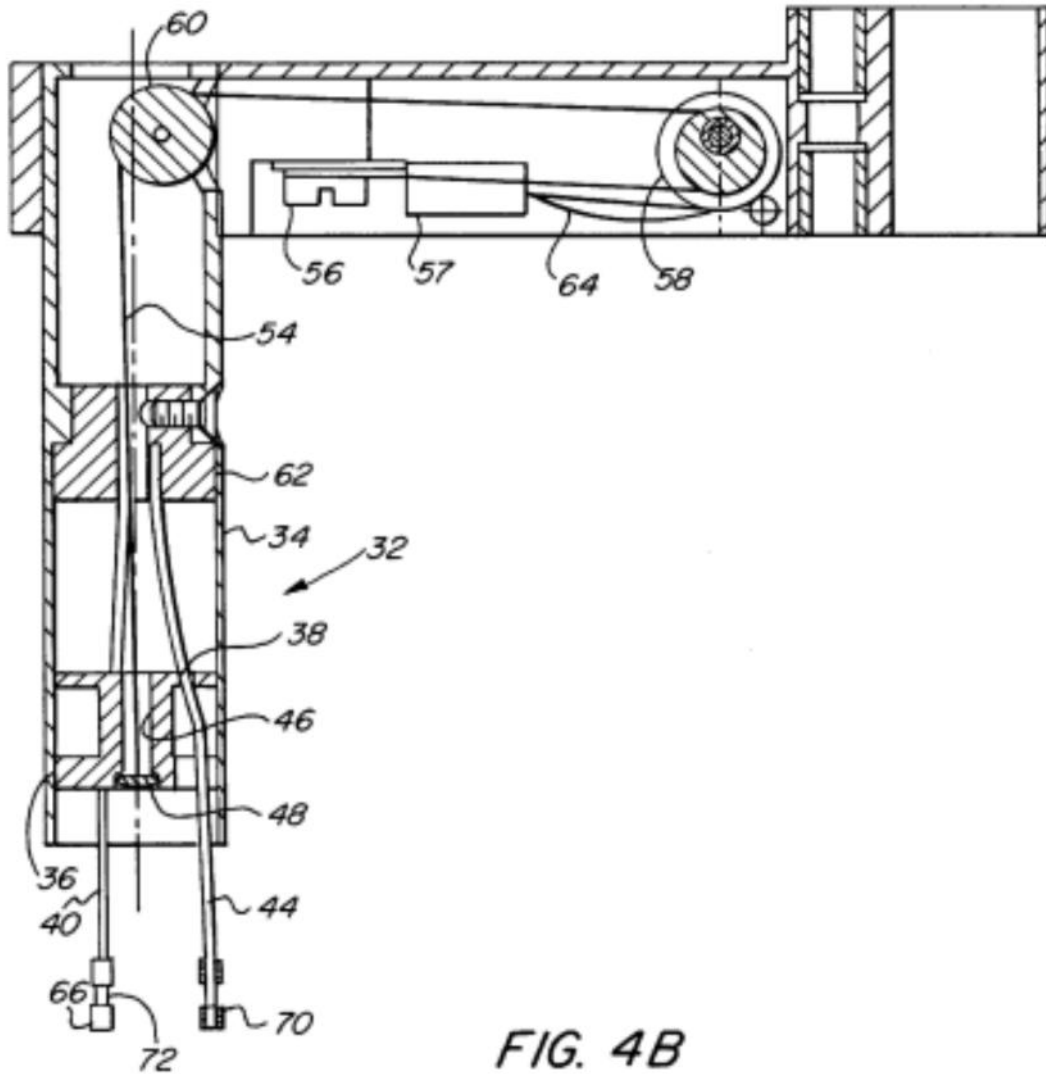


FIG. 4B

71 A gripper 32 is then provided, which has a housing 34 in which a fixed member 62 and a movable member/spool 36 are arranged. The movable member can be moved up and down within the housing. Figure 4 shows the movable member in the lower position, Figure 4B in the upper position.

72 Fingers (40, 42, 44) protrude from the distal end of the gripper, which are arranged in corresponding recesses of the movable member and the ends of which are suitable for gripping a crucible. At the same time, the grippers are suitable for removing a cover (52) of the furnace access hole (26) before inserting a crucible and then placing it back on the hole.

73 The gripper fingers can be moved between an open and a closed position. According to N2, this is done by heating or not heating a shape memory metal wire (shape memory metal wire 54) by applying current. This wire runs from the screw 56 via a terminal block 57, an eccentric screw 58 and a roller 60 through holes in the stationary member 62 and in the movable member 36 to a rod 48. According to the description, this rod is made of a suitable material, preferably of a material which does not absorb heat. As an example of this, the description mentions a rod made of nylon (sp. 5 lines 14-16).

74 If current is applied and the wire is heated, it shortens. This pulls the movable link upwards and the gripper fingers open (Figure 4B). If the current is removed, the shape memory metal wire expands, the movable link slides downwards and the gripper fingers close (Figure 4).

75 cc) The Patent Court rightly decided that it was not obvious to combine the device described in N1 with an autosampler as proposed in N2.

76 (1) Contrary to the opinion of the appellant's reply, however, the device proposed in N2 is not only intended for mother appliances in whose interior temperatures up to a maximum of 120°C prevail.

77 N2 explicitly mentions devices for thermogravimetric analysis as possible mother devices. A restriction to the effect that this information is limited to devices for moisture analysis and that use in connection with a device for ash analysis, in which significantly higher temperatures can prevail, is not to be inferred from N2. Rather, the statements that the device is also suitable for other analysis devices with appropriate adaptation confirm that the range of applications in question is considered to be conceivably wide.

78 (2) As set forth above, the furnace disclosed in N1 is filled with empty crucibles which are first weighed therein and then filled one at a time while remaining in the furnace and weighed again. Accordingly, the lid (28) must first be lifted into the open position (28") to insert empty crucibles and into the loading position (28') in a later operation to fill the crucibles.

79 In contrast, N2 only discloses the insertion of crucibles, but not that the autosampler is also capable of filling crucibles in the furnace with samples. As the defendant argued uncontradicted at the hearing before the Senate, this generally involves material in the form of powder or granules.

80 By supplementing the device according to N1 with an autosampler according to N2, further automation could then be expected at most with regard to filling with empty crucibles. For the subsequent steps, in particular for filling the jars, the lid together with the autosampler would have to be lifted during operation in order to fill the jars manually, as the Patent Court correctly assumed.

81 A modification to the effect that the furnace is loaded with already filled crucibles while remaining essentially closed required fundamental changes to the

procedure disclosed in N1. As the Patent Court rightly assumed, N2 did not suggest this.

82           c)     A different assessment does not result even if N2 is selected as the starting point.

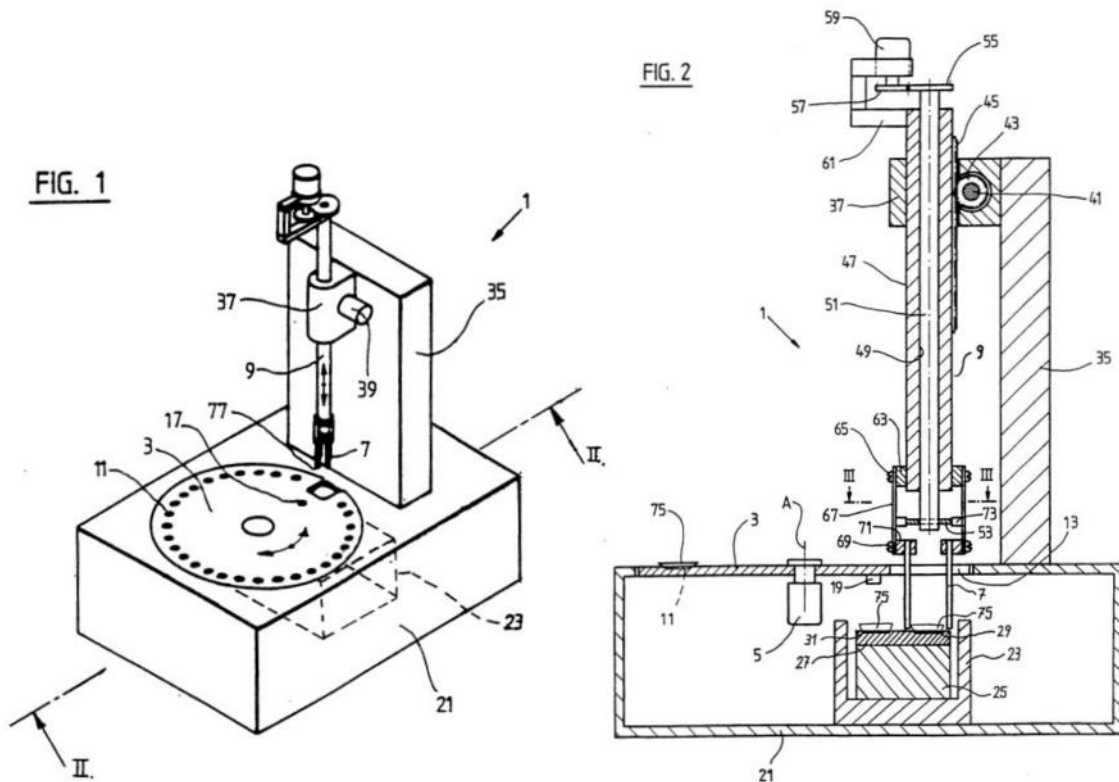
83           aa)    As already explained above, devices for thermogravimetric analysis can also be considered after N2 as the parent device.

84           bb)    N2 does not suggest that the device proposed there should be used with analyzers that can accommodate a large number of crucibles.

85           (1)    The statements in N2 above that the proposed autosampler can be combined with different types of mother devices and in particular with devices for thermogravimetric analysis do not provide any further information on how these devices are designed in detail.

86           (2)    In this respect, the disclosure content of N2 does not go beyond the disclosure content of citation N6, from which the Senate in the first nullity proceedings (referred to there as D10) was not able to infer a sufficient suggestion with regard to the patent in suit (Federal Supreme Court (BGH), judgment of September 5, 2017 - X ZR 85/15 para. 58) and still cannot infer it.

87           N6 discloses a device for feeding a thermoanalytical measuring device with which dry substance or moisture content determinations can also be carried out. An embodiment example is shown in Figures 1 and 2 below.



88 Similar to N2, N6 focuses on the loading device with which crucibles can be inserted into the measuring device. The measuring device itself and the furnace belonging to it are only shown schematically and do not indicate that there is room for more than one container and one reference container. In addition, the furnace itself is shown without a lid. An opening for inserting the crucibles is only provided at the top of the measuring device.

89 Unlike N6, N2 does not show any details of a suitable measuring device in this respect either. However, this does not indicate that the autosampler from N2 can be combined with a larger number of device types than the feeding device from N6.

90 Contrary to the opinion of the appeal, N2 did not provide a sufficient suggestion to use the autosampler disclosed therein with an analysis oven of the type disclosed in N1.

91 As already explained above, empty crucibles are placed in the furnace shown there and weighed, which are then filled with the sample to be analyzed and heated. The autosampler according to N2 cannot be used for such a procedure without further ado.

92 The fingers attached to the gripper can grasp crucibles and insert them into or remove them from the furnace through a furnace access hole. However, they are not suitable for filling a crucible already inserted into the furnace with a sample, which, as has already been mentioned, is usually material in the form of powder or granules. It would then still be necessary to open the lid of the device according to N1 in order to fill the crucibles individually and successively with a sample.

93 In order to arrive at the solution of the patent in suit, it would have been necessary to recognize that a device of the type described in N1, which can accommodate several crucibles, can also be used in such a way that the crucibles can already be filled with a sample outside the furnace and then inserted into the furnace, which can therefore remain essentially closed during loading.

94 Neither N2 nor N1 provides any suggestion in this regard.

95 d) No further suggestions arose from N3 because the device disclosed there is only suitable for moisture analysis, but not for ash analysis.

96 IV. The decision on costs is based on Section 121 (2) Patent Act with Section 91 (1) Code of Civil Procedure (ZPO).

Bacher

Hoffmann

Deichfuß

Rensen

from Pückler

Lower court:

Federal Patent Court, decision of 07.07.2022 - 5 Ni 43/20 (EP) -