



HU000028952T2

(19) **HU****MAGYARORSZÁG**
Szellemi Tulajdon Nemzeti Hivatala(11) Lajstromszám: **E 028 952**(13) **T2****EURÓPAI SZABADALOM**
SZÖVEGÉNEK FORDÍTÁSA(21) Magyar ügyszám: **E 09 731567**(22) A bejelentés napja: **2009. 04. 17.**(51) Int. Cl.: **B22D 41/24** (2006.01)**B22D 41/28** (2006.01)

(96) Az európai bejelentés bejelentési száma:

EP 20090731567

(86) A nemzetközi (PCT) bejelentési szám:

PCT/EP 09/002815

(97) Az európai bejelentés közzétételi adatai:

EP 2268432 A1 **2009. 10. 22.**

(87) A nemzetközi közzétételi szám:

WO 09127420

(97) Az európai szabadalom megadásának meghirdetési adatai:

EP 2268432 B1 **2016. 04. 13.**

(30) Elsőbbségi adatok:

603082008**2008. 04. 17.****CH**

(73) Jogosult(ak):

Stopinc Aktiengesellschaft, 6331 Hünenberg
(CH)

(72) Feltaláló(k):

STEINER, Benno, CH-6244 Nebikon (CH)**KELLER, Werner, CH-6312 Steinhausen (CH)****TRUTTMANN, Urs, CH-6333 Hünenberg See (CH)**

(74) Képviselő:

Danubia Szabadalmi és Jogi Iroda Kft.,
Budapest

(54)

Zárólap, valamint tolózár egy fémolvadék-tartály csapolónyílásán

Az európai szabadalom ellen, megadásának az Európai Szabadalmi Közlönyben való meghirdetésétől számított kilenc hónapon belül, felszólalást lehet benyújtani az Európai Szabadalmi Hivatalnál. (Európai Szabadalmi Egyezmény 99. cikk(1))

A fordítást a szabadalmas az 1995. évi XXXIII. törvény 84/H. §-a szerint nyújtotta be. A fordítás tartalmi helyességét a Szellemi Tulajdon Nemzeti Hivatala nem vizsgálta.

Closing plate and sliding closure on the spout of a receptacle for molten metal

The invention relates to a closing plate for a sliding closure on the spout of a receptacle for molten metal, especially of a converter, according to the preamble to Claim 1 and a sliding closure according to Claim 4.

With the document EP-A-0 468 363 it is disclosed an apparatus for the exchange of a pouring tube, with which with the one embodiment bed plates are provided, which are displaceable in the pouring position between the pouring tube and a fixed bottom plate. With a change a new bed plate can be brought into the pouring position and thereby the worn plate can be removed by this new one. Suggestively tapering sections are stipulated on the one side of the sliding surfaces on both ends. But there is neither learned an indication of the purpose nor a specific shape of these tapered sections.

With a further refractory closing plate according to the document JP-A-2-59855 tapered sections respectively radius at the sliding surfaces with the crossing sides in the sliding direction are indicated, but to which a function for an engagement with another plate is not disclosed.

Sliding closures on the spout of receptacles for molten metal are known in a wide variety of embodiments. A sliding closure, which is used in particular to open and close a converter spout opening, is disclosed for example in EP 0 819 488 B1. It comprises a housing frame in which are disposed a stationary refractory closing plate (a so-called base plate) and a refractory sliding plate held in a sliding unit displaceable in relation to said closing plate. The sliding plate can be pressed sealingly with its upper sliding surface against a lower sliding surface of the base plate. The housing frame is fastened releaseably to a base plate fixed to the receptacle, the base plate being braceable with its upper sliding surface with a refractory spout head part inserted into the base plate. During casting operation the refractory parts are subjected to a high degree of wear. It is therefore necessary to change them relatively frequently. For this purpose the housing frame must be respectively released from the base plate.

Since, as shown from experience, when using the sliding closure on the converter spout the base plate in particular wears very quickly, it is related according to WO2009127333 to dispose moveably in the housing frame a case with at least two base plates in the housing frame, by means of the displacement a worn base plate being able to be removed from the operating position, and replaced by another base plate without the housing frame having to be removed from the base plate. In this way it is possible to maintain the casting operation for longer until the other refractory parts are also due to be changed.

The closing plates for a sliding closure are known to comprise a respective elongate refractory plate surrounded by a sheet metal jacket and which can also be in several parts.

The object forming the basis of the present invention is to provide a closing plate for a sliding closure on the spout of a receptacle for molten metal, in particular of a converter, which enables particularly gentle bracing with another closing plate or with a refractory spout head part. Furthermore, a sliding closure particularly suitable for converters is to be further improved.

This object is achieved according to the invention by a closing plate having the features of Claim 1 and by a sliding closure having the features of Claim 4.

Further preferred embodiments of the closing plate according to the invention form the subject matter of the dependent claims.

With the closing plate according to the invention the risk of damage to the front faces of the refractory parts to be braced with each other when starting the bracing and/or during a relative displacement of the refractory parts to be braced with each other can be substantially reduced.

In the following the invention is described in greater detail by means of the drawings. These show as follows:

- Fig. 1 a longitudinal section of an exemplary embodiment of a closing
 plate according to the invention;
- Fig. 2 a top view of the closing plate according to Fig. 1;
- Fig. 3 a section along line III-III in Fig. 2;
- Fig. 4 a detail X from Fig. 3 in an enlarged scale;
- Fig. 5 a longitudinal section of an exemplary embodiment of a sliding
 closure upon pivoting onto the spout of a converter;
- Fig. 6 a cross-section of the sliding closure according to Fig. 5 with a
 case located in an initial position and containing two base
 plates; and
- Fig. 7 a cross-section of the sliding closure according to Fig. 5 with the
 case in a final position.

In Fig. 1 to Fig. 4 a closing plate 10 for a sliding closure on the spout of a receptacle for molten metal is shown. This can be, for example, a so-called base plate of a sliding closure 1 for a converter, shown in greater detail in Figs. 5 to 7, as will be described in greater detail below. The closing plate 10 has an elongate form, and optionally an octagonal outer contour. It comprises a multi-part refractory plate 11 and a sheet metal jacket 12 surrounding the latter. The refractory plate 11 provided with a spout opening 13 has a lower sliding surface 14 and an upper sliding surface 15. The refractory plate 11 can on the one hand be braced with the lower sliding surface 14 with a sliding plate 20 of the sliding closure 1, and on the other hand with the upper sliding surface 15 with a lower sliding surface 21' of a refractory receptacle spout head part 21.

The refractory plate 11 has in a section projecting beyond the sheet metal jacket 12 a tapering section 26 which forms an angle α with the sliding surface 15 at least along a side delimiting the sliding surface 15 along one of the two narrow sides 16, 17, the angle α preferably being between 10° and 15° . In addition, with the refractory plate 11 as well as the tapering section 26 a respective tapering section 29, 29 is provided with the sliding surface 14, these being associated with the two longitudinal sides 18, 19 parallel to the longitudinal axis L.

As already mentioned, the closing plate 10 according to the invention can be accommodated as a stationary base plate in a housing frame 30 of the sliding closure 1 according to Fig. 5 in which housing frame 30 is displaceably disposed a sliding unit 31 with the sliding plate 20, the longitudinal axis L of the closing plate 10 extending in the direction of displacement of the sliding closure 1. The housing frame 30 is removeably attached to a base

plate 32 fixed to the receptacle. Preferably suspension means are provided for the pivotable positioning of the housing frame 30 on the base plate 32 fixed to the receptacle, the pivot axis A extending at a right angle to the direction of displacement of the sliding unit 31.

In Fig. 5 it is particularly illustrated how the housing frame 30 with the refractory parts mounted therein are pivoted about the axis A and are then fixed to the base plate 32 using fixing means (not shown), the refractory parts being braced with spring elements provided in the housing frame 30.

With the tapering section 26 according to the invention of the narrow side 16 of the refractory plate 11 lying closer to the pivot axis A, with contact of the base plate with the lower sliding surface 21' of the refractory spout head part 21 fitted in the base plate 32 fixed to the receptacle damage to these refractory parts normally made of ceramic material is largely avoided. As additional security the spring elements are designed with a spring characteristic curve such that initially only very slight contact forces come into contact with this tapered section 26 of the refractory plate 11 striking the head part first before the full spring force takes effect upon the plate 11 resting two-dimensionally on the head part 21.

With the sliding closure 1 according to Fig. 6 and Fig. 7 the housing frame 30 contains a case 40 displaceable at a right angle to the direction of displacement of the sliding unit 20 with at least two closing plates 10a, 10b serving as base plates, it being possible to remove the one closing plate 10a by displacing the case 40 from the operating position according to Fig. 6, and replacing it with the other closing plate 10b (Fig. 7), without the housing frame 30 having to be dismantled. The precise design and mode of operation of this type of sliding closure can be learnt from the previously mentioned earlier WO2009127333, and is therefore not described in detail.

According to the invention the refractory plates 11 of all closing plates 10a, 10b are provided with tapering sections 28, 29, at least along the longitudinal sides 18, 19 to the front in relation to the case displacement so as to avoid damage with their sliding surfaces during the mutual displacement of the refractory parts braced with one another with full contact force. This risk of striking of the edges arises primarily due to the differences in thickness of the refractory plates and the head part 21 arising due to dimensional tolerances. Preferably, both longitudinal sides 18, 19 of the respective refractory plate 11 are provided with tapering sections 28, 29, in particular if a to and fro displacement of the case 40 is provided for the purpose of simplifying the changeover process.

The closing plate 10 serving as a stationary base plate could by all means also have tapering sections on the sliding surface 14 associated with the sliding plate 20 on the narrow sides 16, 17, or the sliding plate 20 could itself be provided with this type of tapering sections.

This type of sliding plate could also be formed on the side facing away from the sliding surface with a spring known in its own right and so only be provided on the one side with a sliding surface with which within the framework of the invention, for example, on the one narrow side of the sliding surface a tapering section could be provided so that upon pivoting the sliding unit by means of two-dimensional contact, due to this tapering section the sliding plate would not come into contact square on with the base

plate.

The invention is illustrated sufficiently by the exemplary embodiments described. It could, however, also be implemented by additional versions. Therefore, the sheet metal jacket 12 surrounding the refractory plate 11 can be a deep-drawn sheet metal, a binding or also a cassette frame or similar.

With a platform with which the outer sides extend at an angle to the longitudinal axis L of the plate or these outer sides are rounded, this tapering section according to the invention with the refractory plate could not be provided over the whole length, but only in a partial section.

Zárólap, valamint tolózár egy fémolvadék-tartály csapolónyílásán

Szabadalmi igénypontok

1. Zárólap egy fémolvadék-tartály, főként egy konverter csapolónyílásán levő tolózár számára, egy hosszúkás, zárólap-hossztengelyt (L) képező tűzálló lappal (11) és egy ezt körülvevő lemezköpennyel (12), ahol egy a hossz tengelyen (L) elhelyezkedő kiömlőnyílással ellátott tűzálló lap (11) csúszófelületeken (14, 15) keresztül összefeszíthető egy másik tűzálló zárólap egy ilyen csúszófelületével vagy egy tűzálló fejrész (21) csúszófelületével (21'), *azzal jellemezve*, hogy a tűzálló lap (11) legalább az egyik csúszófelülettel (15) ellentétes oldalon húzódó csúszófelületet (14) határoló azon hosszanti oldalak (18, 19) mentén, amelyek párhuzamosak a zárólap-hossztengellyel (L), az egyik csúszófelülettel (15) ellentétes oldalon levő csúszófelülettel (14) szöget (α) bezáró lerészeléssel (28, 29) rendelkezik, amely a tűzálló lap (11) lemezköpenyből (12) kiálló tartományához van hozzárendelve.

2. Az 1. igénypont szerinti zárólap, *azzal jellemezve*, hogy ezen lerészelés (26, 28, 29) szöge (α) 10° és 15° közé esik.

3. Az 1. vagy 2. igénypont szerinti zárólap, *azzal jellemezve*, hogy a lerészelés (26) a tűzálló lapnak (11) egy a zárólap-hossztengelyre (L) keresztirányban húzódó keskenyebb oldalához (16) van hozzárendelve.

4. Tolózár egy fémolvadék-tartály, főként egy konverter csapolónyílásán, egy az 1-3. igénypontok bármelyike szerinti zárólap (10), *azzal jellemezve*, hogy a zárólap (10) helyhez kötött fenéklapként egy tartályhoz erősített alaplaphoz (32) felszerelhető burkolókeretben (30) van elhelyezve, amelyben egy síklólap (20) ellátott tolattyús egység (31) van eltolhatóan elrendezve, ahol a zárólap-hossztengely (L) a tolattyús egység (31) eltolási irányában húzódik, ugyanakkor a zárólap (10), illetve annak az lerészelésekkel (26, 28, 29) ellátott tűzálló lapja (11) csúszófelületén (15) keresztül összefeszíthető egy az alaplaphoz (32) behelyezett tűzálló csapolónyílás-fejrész (21) csúszófelületével (21').

5. A 4. igénypont szerinti tolózár, *azzal jellemezve*, hogy függesztőeszközök vannak elrendezve a burkolókeret (30) tartályhoz erősített alaplapon (32) való elfordítható elrendezéséhez és rögzítőeszközök a burkolókeret (30) oldható rögzítéséhez, ahol az elfordítási tengely (A) a tolattyús egység (31) eltolási irányára keresztirányban húzódik, ugyanakkor a tűzálló lapnak (11) az elfordítási tengelyhez (A) közelebb eső keskenyebb oldala (16) lerészeléssel (26) van ellátva.

6. A 4. vagy 5. igénypont szerinti tolózár, *azzal jellemezve*, hogy a burkolókeretben (30) egy kazetta (40) van eltolhatóan elrendezve, amely az egy zárólap (10a) mellett még legalább egy további, azonosan kialakított

zárólapot (10b) tartalmaz, ahol a további zárólap (10b) a kazetta (40) eltolásával üzemi helyzetbe hozható és ily módon az első zárólap (10a) lecserélhető.

7. A 6. igénypont szerinti tolozár, *azzal jellemezve*, hogy a kazetta (40) eltolási iránya a tolattyús egység (31) eltolási irányára keresztirányban húzódik.

8. A 7. igénypont szerinti tolozár, *azzal jellemezve*, hogy valamennyi zárólap (10a, 10b) tűzálló lapjai (11) legalább a kazettaeltolásra vonatkoztatva elülső hosszanti oldalak (18, 19) mentén lerézsélésekkel (28, 29) rendelkeznek.

9. A 6-8. igénypontok bármelyike szerinti tolozár, *azzal jellemezve*, hogy a kazetta (40) a kiindulási helyzete és a véghelyzete között ide-oda eltolható, ahol a mindenkori tűzálló lap (11) mindkét hosszanti oldala (18, 19) lerézsélésekkel (28, 29) van ellátva.

Fig. 1

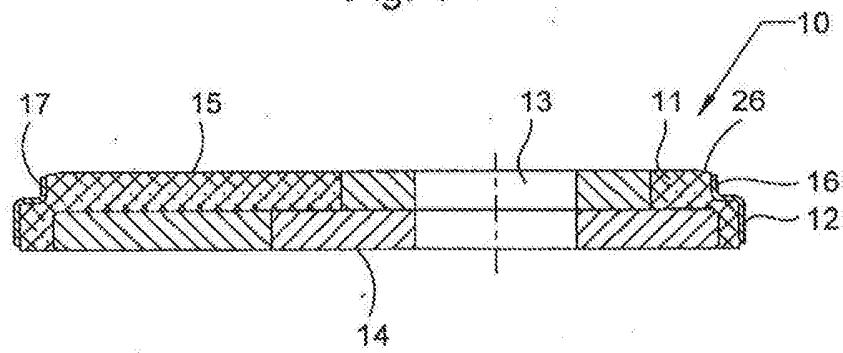


Fig. 2

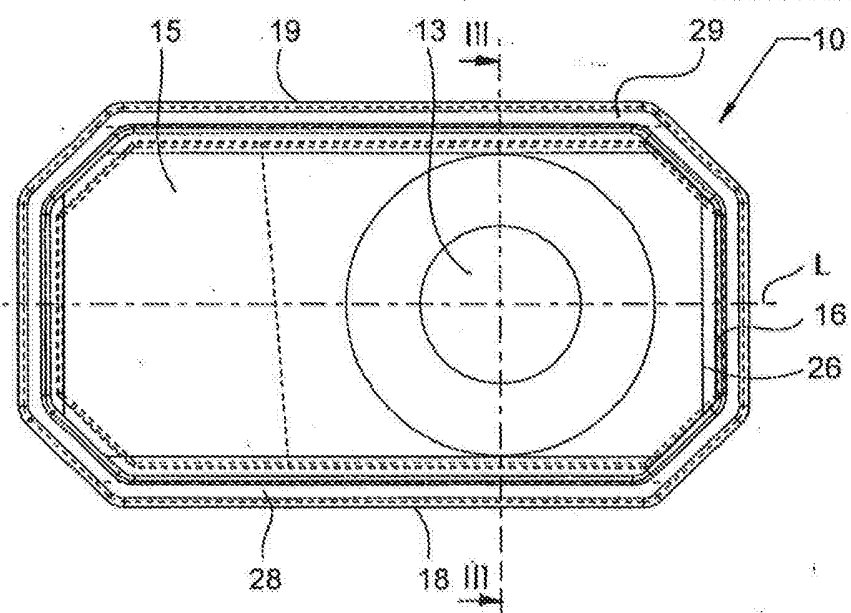


Fig. 3

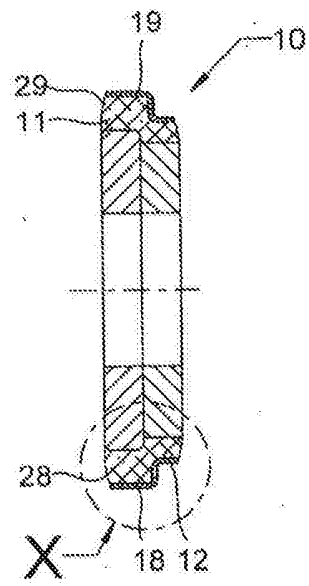


Fig. 4

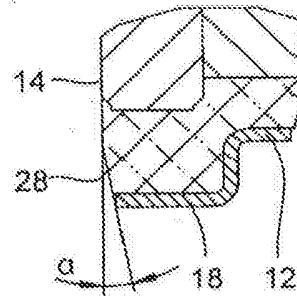


Fig. 5

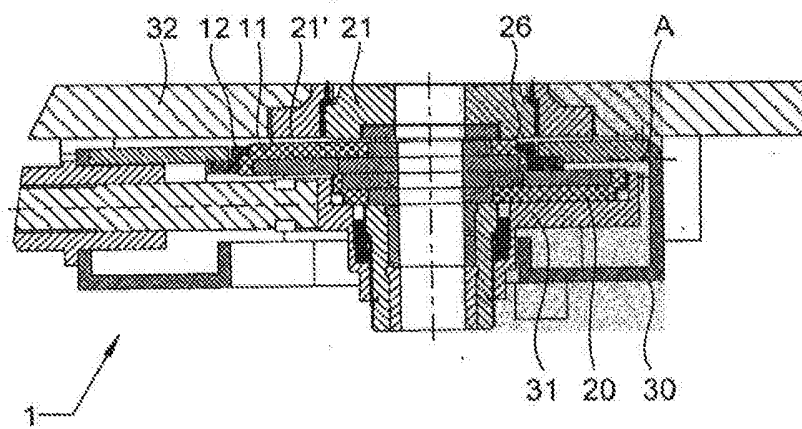


Fig. 6

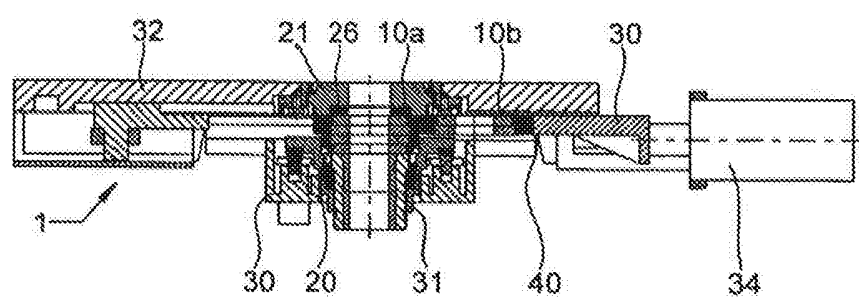


Fig. 7

