featuring at least one slit, which extends continuously from the edge (the upper free end of the wall) to the bottom, whereby the slit width at the widest spot is less than 10% of the width in direction of the width of the ground plan.

Usually impact pads have a circular or rectangular base. Correspondingly the wall is infinite or consists of four wall segments. The base can also be differently, for example oval shaped or egg shaped. The invention is mainly related to impact pads, which are symmetrical (mirror inverted) regarding a vertical plane.

Details in the following are related to a common function of the impact pad (functional position), wherein the base of the impact pad lies on or in the base of a metallurgic vessel and wherein the wall of the impact pad is mainly extending perpendicular to the base and thereby mainly perpendicular to the base of the metallurgic vessel in an upward direction.

The impact pad according to DE 102 02 537 C1 leads to the fact that metal melt entering the impact pad drains at least partially through the wall-sided slit. Because of the relatively small slit width, the metal melt flowing through the slit can feature a significant flow speed. Thereby, further flow turbulences are caused.

The essay "Melt flow characterisation in Continuous Casting Tundishes" (ISIJ International, Vol. 36 (1996), No. 6, p. 667-672) defines a so called plug flow, wherein all fluid elements have the same residence time in the tundish and a so called dead volume. The dead volume characterises the fluid part, whose residence time is more than double of the average residence time of the melt in the tundish.

Hereinafter these characterisations are phenomenologically transferred to the flow (stream) of a metal melt in a tundish, into which an impact pad corresponding to the invention is integrated.

~~The task~~Embodiments of the invention ~~is to~~ provide an impact pad, which allows the following optimisations:

- an aimed guidance of the metal melt in the impact pad and tundish
- minimisation of flow turbulences in the tundish

By this means a relatively wide volume stream (flow) with a relatively low flow speed is laterally led out of the impact pad in the upper segment of the impact pad. Analogously the volume stream which escapes close to the base of the impact pad is narrower and features a higher flow speed. Because of this flow profile, turbulences are reduced when entering the molten metal bath in the metallurgical vessel.

This leads to a lesser erosion of the fireproof material of the impact pad, especially in the area of the flanks (boundaries) of the opening. Correspondingly, fewer pollutants (impurities) get into the metal melt in the tundish.

A further part of the flow leaves the impact pad - as known – upwardly.

The specific geometry of the opening and the thereby caused specific flow of the melt, through the sidewall opening in the impact pad also leads to the wanted reduction of dead volume in the tundish and to a higher percentage of plug flow as the following chart shows:

	Dead volume	Plug flow
Impact pad with closed wall according to US5358551	28%	24%
Impact pad with small, linear slit according to DE 10202537C1	28%	26%
Impact pad according to claim 1 and Fig. 4	24%	30%

The formation of openings with relatively big cross-sections in the wall-area of the impact pad leads to the fact that less fireproof (refractory) material has to be used. This reduces the manufacturing costs.

~~In its most general embodiment, the invention relates to~~According to an aspect of the invention, there is provided a fireproof ceramic impact pad with the following characteristics in its functional position:

- a bottom with a lower base-area and an upper impact-area
- a wall, consisting of several segments, which extends from the bottom up to a free end-segment, wherein the wall with its inside and the impact area border a space, which is open at its end opposite the bottom,
- at least one segment of the wall features at least one opening, which runs from the inside (inner face) of the wall continuously to the outside (outer face) of the wall and which is bordered by opposite flanks,
- the opening features the following cross-sectional profile:
- regarding the perimeter direction of the wall the opening has its largest width adjacent to the free end segment
- regarding the perimeter direction of the wall the opening has its smallest width adjacent to the bottom,
- the opening extends along more than 40% of the height of the wall,
- the largest width of the opening is more than 5% of the total perimeter of the wall of the impact pad.
- in a longitudinal direction, from the upper free end segment of the wall vertically downwards toward the bottom, the opening extends in a profile with more than 70% of its cross-section in the upper half, adjacent to the free end segment of the wall.

In the side view, there is regularly a geometry of the opening, wherein the distance between the flanks of the opening is much wider at the top than at the bottom. Possible cross-sectional profiles are presented and explained in the following description of a drawing.

The opening can continue upwardly such that the free end of the wall is interrupted. The opening can also be arranged as a discrete opening in the wall being surrounded all along its periphery by wall segments. To achieve an optimised flow and flow distribution, cross-sectional profiles are preferred which are symmetrical to a plane running perpendicular to the inside of the wall, or in other words: The mirror plane runs radial with an impact pad of circular layout (base), whose wall features a cylindrical peripheral area.

The flow profile is optimised when the opening features curved flanks, especially between the parts of the largest and smallest width. In a side view a profile of the opening similar to a cone or nozzle is visible.

2, for the smallest width: < 100mm, <75mm, < 50mm, <25mm, < 10mm

According to one embodiment of the invention, corresponding flanks of the opening are arranged with increasing distance between the inside of the wall and a corresponding outside of the wall.
Thereby, a kind of "diffuser" is formed with the result, that the cross sectional area of the opening between the inside and the outside of the wall increases in size (expanding fan-shaped). Thus a balloon-type volume stream/flow is led into the metal bath of the metallurgic vessel, which leads to a decrease of turbulences in the metallurgic vessel.

Within this embodiment the flanks can be curved towards the outer surrounding, which supports this effect.

Further characteristics of the invention result from the characteristics of the ~~sub-claims~~embodiments and the further application documents. The named characteristics can be important for the realisation of the invention by their own or in any combination with each other. As far as it isn't excluded explicitly the characteristics of individual embodiments can be combined with each other as far as it is technically possible.

The figures show, each in a schematic representation:

Figure 1: A perspective view of an impact pad
Figure 2: Possible cross-sectional shapes of the opening in the wall of the impact pad
Figure 3: A perspective view of a further embodiment of an impact pad
Figure 4: A top-view, a longitudinal section and a lateral view of a third embodiment of the impact pad

The impact pad according to figure 1 is structured as followed: It possesses a rectangular bottom 10 with a lower base area 10g and an upper impact surface 10p, A wall 20 extends from the rim area of the bottom 10 , which correspondingly contains four wall segments 20a, 20b, 20c and 20d.

The wall 20 with its inside 20i and the impact surface 10p border a space 30, which is open towards the top, thus opposite the bottom.