Further, a towing staple for a vessel for towing is provided. The towing staple is configured to guide a towing line. The towing staple comprises a guiding element having a symmetrical extension in a first plane wherein the guiding element comprises a first and a second mounting section for mounting the guiding element to a hull of the vessel for towing, wherein the first and second mounting sections are connected by means of a main section of the guiding element. The guiding element comprises a towing line guiding surface located on a bottom side of the main section. The towing line guiding surface configured to, during a towing procedure, slidably contact the towing line, such that the towing line can freely move along a periphery of the main section in the first plane while being restricted in movement by the main section in a direction perpendicular to the first plane. The towing staple further comprises a support element, wherein the support element is arranged on a top side of the main section and extends at an angle to the first plane from the top side of the guiding element to the second plane perpendicular to the first plane and extending through the first and second mounting sections.

It is an advantage of the present disclosure that the towing staple when it is in contact with the towing line acts as a towing point and lowers a position of the towing point in relation to the deck of the vessel for towing and moves it closer to a side of the hull of the vessel for towing. By lowering the towing point the heeling moment created by the towing line force and acting on the hull of the vessel for towing is reduced. Furthermore, by moving the towing point closer to the side of the vessel for towing the heeling lever arm may be reduced while a righting lever arm is increased. The towing staple of the present disclosure thus improves the stability of the vessel for towing, and improves maneuverability, and direct and indirect towing performance of the vessel for towing. By adding a support element to the towing staple, a rigidity of the towing staple is further increased which reduces the risk of the towing staple failing and causing injuries of crew members due to failed guiding of the towing line.

Furthermore, the solution according to the present disclosure does not comprise any movable parts which reduces the cost of the solution and improves reliability of the solution.

The towing staple according to the present disclosure thus improves maneuverability, direct and indirect towing performance, and stability of the vessel for towing, while reducing costs and improving reliability compared to existing towing solutions.

CLAIMS

1. A hull for a vessel for towing, comprising

   - a deck; and

   - a towing staple for guiding a towing line,

wherein the towing staple comprises:

   - a guiding element having a symmetrical extension in a first plane parallel to the deck, wherein the guiding element comprises a first and a second mounting section mounting the guiding element to the hull, wherein the first and second mounting sections are connected by means of a main section of the guiding element, wherein the guiding element comprises a towing line guiding surface located on a bottom side of the main section facing the deck, the towing line guiding surface being configured to, during a towing procedure, slidably contact the towing line, such that the towing line can freely move along a periphery of the main section in the first plane while being restricted in movement by the main section in a direction perpendicular to the first plane, and

   - a support element, wherein the support element is arranged on a top side of the main section and extends at an angle to the first plane from the top side of the guiding element to a second plane perpendicular to the first plane and extending through the first and second mounting sections.

2. The hull according to claim 1, wherein the guiding element of the towing staple has an arch-shaped form, when seen in the first plane.

3. The hull according to claim 1 or 2, wherein the guiding element has a U-shape, when seen in the first plane, such that the main section comprises two parallel sections and a curved section, wherein the end sections of the two parallel sections of the U-shaped guiding element constitute the mounting sections.

4. The hull according to any one of the claims 1 to 3, the hull further comprising a fairlead for guiding the towing line, wherein the fairlead is arranged at a longitudinal center plane of the towing staple.

5. The hull according to claim 4, wherein the guiding element is shaped so that the distance from the fairlead to the towing line guiding surface of the guiding element varies over the periphery of the guiding element.

6. The hull according to claim 4 or 5, wherein the towing staple spans a viewing angle of at least 140° seen from the fairlead in a direction of a longitudinal centerline of the hull.

7. The hull according to any one of the claims 4 to 6, wherein the support element extends from a top side of the towing staple facing away from the deck to a connection point located further away from the deck than the fairlead in a vertical direction of the hull.

8. The hull according to any one of the claims 1 to 7, wherein the towing staple is arranged within an inner periphery of the hull.

9. The hull according to any one of the claims 1 to 8, wherein a width of the guiding element between the first and second mounting sections is adapted to move a towing point away from the longitudinal centerline of the hull towards an outer side of the hull.

10. The hull according to any one of the previous claims, wherein a distance from the towing staple to the deck is in a range of 10cm to 200cm.

11. The hull according to any of the previous claims, wherein the support element comprises a sheet material extending from the top side of the guiding element to the second plane, such that the support element creates an enclosure covering the guiding element.

12. The hull according to claim 11, wherein the support element has a first edge being arranged on and following the circumference of the guiding element along the top side of the guiding element, and a second edge being parallel to the second plane and mounted to the hull at the second plane.

13. The hull according to any of the previous claims, wherein the guiding element comprises a lubrication system for lubricating the towing line during a towing procedure.

14. The hull according to claim 13, wherein the lubrication system comprises a plurality of openings in the towing line guiding surface of the guiding element and a lubricant feeding system for feeding lubricant through the plurality of openings onto the towing line.

15. The hull according to any one of the previous claims, wherein the hull comprises an accommodation building, and wherein the second plane is located on an aft or fore facing wall of the accommodation building.

16. The hull according to any one of the previous claims, wherein the towing staple is an integral part of the hull.

17. A towing staple for a vessel for towing, wherein the towing staple is configured to guide a towing line, the towing staple comprising:

- a guiding element having a symmetrical extension in a first plane, wherein the guiding element comprises a first and a second mounting section for mounting the guiding element to a hull of the vessel for towing, wherein the first and second mounting sections are connected by means of a main section of the guiding element, wherein the guiding element comprises a towing line guiding surface located on a bottom side of the main section, the towing line guiding surface being configured to, during a towing procedure, slidably contact the towing line, such that the towing line can freely move along a periphery of the main section in the first plane while being restricted in movement by the main section in a direction perpendicular to the first plane, and

- a support element, wherein the support element is arranged on a top side of the main section and extends at an angle to the first plane from the top side of the guiding element to a second plane perpendicular to the first plane and extending through the first and second mounting sections.

18. The towing staple according to claim 17, wherein the support element has a base end and a top end, wherein the base end is arranged on the guiding element and the top end is configured for being mounted to a mounting area located in the second plane.

19. The towing staple according to any of the claims 17 to 18, wherein the support element comprises a sheet material extending from the top side of the guiding element to the second plane, such that the support element creates an enclosure covering the guiding element.

20. The towing staple according to any one of the claims 17 to 19, wherein the guiding element comprises a lubrication system for lubricating the towing line during a towing procedure.