CLAIMS

1. A die casting system, comprising:

a die including a plurality of die components that define a die cavity;

a shot tube in fluid communication with said die cavity;

a shot tube plunger moveable within said shot tube to communicate a charge of material into said die cavity;

a melting unit positioned relative to said die, wherein said melting unit includes a bottom portion having an opening for selectively releasing said charge of material through said bottom portion; and

said melting unit including a heating system that includes a first induction coil disposed about a body and a second induction coil disposed about said bottom portion.

2. The system as recited in claim 1, wherein said melting unit includes a top portion opposite from said bottom portion and a body that extends between said top portion and said bottom portion.

3. The system as recited in claim 1, wherein said heating system includes an induction skull melting system.

4. The system as recited in claim 1, wherein said heating system includes an induction melting system.

5. The system as recited in claim 1, wherein said heating system includes a resistance melting system.

6. The system as recited in claim 1, wherein said heating system includes an electron beam melting system.

7. The system as recited in claim 1, wherein said heating system includes a levitation melting system.

8. The system as recited in claim 1, wherein said heating system includes a resistance element disposed about said bottom portion of said melting unit.

9. The system as recited in claim 1, wherein said heating system includes resistance heating elements disposed about an outer surface of a body of said melting unit.

10. The system as recited in claim 1, wherein said heating system includes a laser positioned to melt said charge of material.

11. The system as recited in claim 1, comprising a closure member positioned relative to said opening.

12. The system as recited in claim 11, wherein said closure member includes a door that is selectively moveable between a first position and a second position to uncover said opening and release said charge of material.

13. The system as recited in claim 11, wherein said closure member includes a cooled chill door.

14. The system as recited in claim 12, wherein said door is pivoted between said first position and said second position.

15. The system as recited in claim 12, wherein said door is axially translated between said first position and said second position.

16. The system as recited in claim 1, wherein said charge of material is released through said opening of a bottom-most surface of said bottom portion into one of said die and said shot tube.

17. A method of die casting a component with a die casting system having a die, a shot tube and a melting unit, comprising the steps of:

(a) melting a charge of material inside the melting unit of the die casting system, wherein the step of melting includes heating the charge of material inside a body of the melting unit with a first induction coil and heating a bottom portion of the melting unit to re-melt a skull with a second induction coil;

(b) releasing the charge of material through an opening disposed in the bottom portion of the melting unit into the die casting system; and

(c) injecting the charge of material into a die cavity of the die to cast the component.

18. The method as recited in claim 17, wherein said step (b) includes the step of:

selectively actuating a closure member between a first position and a second position to uncover the opening and release the charge of material through a bottom-most surface of the bottom portion.

19. The method as recited in claim 18, wherein said step (b) includes the step of:

releasing the charge of material directly into one of the die and the shot tube of the die casting system.

20. A melting unit for a die casting system, comprising:

a top portion, a bottom portion and a body that extends between said top portion and said bottom portion;

an opening that extends through said bottom portion;

a closure member positioned relative to said opening and selectively moveable between a first position and a second position to uncover said opening and release a charge of material through said bottom portion; and

a heating system that includes a first induction coil disposed about said body and a second induction coil disposed about said closure member.

21. The melting unit as recited in claim 20, wherein said heating system includes a first induction coil disposed about said body and a secondary induction coil disposed about said bottom portion.

22. The melting unit as recited in claim 20, wherein said heating system includes an induction skull melting system.

23. The melting unit as recited in claim 20, wherein said opening extends through a bottom-most surface of said bottom portion.

CLAIMS

1. A die casting system, comprising:

a die including a plurality of die components that define a die cavity;

a shot tube in fluid communication with said die cavity;

a shot tube plunger moveable within said shot tube to communicate a charge of material into said die cavity;

a melting unit positioned relative to said die, wherein said melting unit includes a bottom portion having an opening for selectively releasing said charge of material through said bottom portion and a closure member positioned relative to said opening and moveable to release said charge of material; and

said melting unit including a heating system that includes a first induction coil disposed about a body of said melting unit and a second induction coil disposed about said closure member.

2. The system as recited in claim 1, wherein said melting unit includes a top portion opposite from said bottom portion and a body that extends between said top portion and said bottom portion.

3. The system as recited in claim 1, wherein said heating system includes an induction skull melting system.

4. The system as recited in claim 1, wherein said heating system includes an induction melting system.

5. The system as recited in claim 1, wherein said heating system includes a resistance melting system.

6. The system as recited in claim 1, wherein said heating system includes an electron beam melting system.

7. The system as recited in claim 1, wherein said heating system includes a levitation melting system.

8. The system as recited in claim 1, wherein said heating system includes a resistance element disposed about said bottom portion of said melting unit.

9. The system as recited in claim 1, wherein said heating system includes resistance heating elements disposed about an outer surface of a body of said melting unit.

10. The system as recited in claim 1, wherein said heating system includes a laser positioned to melt said charge of material.

11. The system as recited in claim 1, wherein said closure member includes a door that is selectively moveable between a first position and a second position to uncover said opening and release said charge of material.

12. The system as recited in claim 11, wherein said closure member includes a cooled chill door.

13. The system as recited in claim 12, wherein said door is pivoted between said first position and said second position.

14. The system as recited in claim 12, wherein said door is axially translated between said first position and said second position.

15. The system as recited in claim 1, wherein said charge of material is released through said opening of a bottom-most surface of said bottom portion into one of said die and said shot tube.

16. A method of die casting a component with a die casting system having a die, a shot tube and a melting unit, comprising the steps of:

(a) melting a charge of material inside the melting unit of the die casting system, wherein the step of melting includes heating the charge of material inside a body of the melting unit with a first induction coil and heating a bottom portion of the melting unit to re-melt a skull with a second induction coil, the melting unit including a closure member positioned relative to an opening disposed in the bottom portion of the melting unit and the first induction coil is circumferentially disposed about the melting unit and the second induction coil is circumferentially disposed about the closure member;

(b) releasing the charge of material through an opening disposed in the bottom portion of the melting unit into the die casting system; and

(c) injecting the charge of material into a die cavity of the die to cast the component.

17. The method as recited in claim 16, wherein said step (b) includes the step of:

selectively actuating the closure member between a first position and a second position to uncover the opening and release the charge of material through a bottom-most surface of the bottom portion.

18. The method as recited in claim 16, wherein said step (b) includes the step of:

releasing the charge of material directly into one of the die and the shot tube of the die casting system.

19. A melting unit for a die casting system, comprising:

a top portion, a bottom portion and a body that extends between said top portion and said bottom portion;

an opening that extends through said bottom portion;

a closure member positioned relative to said opening and selectively moveable between a first position and a second position to uncover said opening and release a charge of material through said bottom portion; and

a heating system that includes a first induction coil disposed about said body and a second induction coil disposed about said closure member.

20. The melting unit as recited in claim 19, wherein said heating system includes a first induction coil disposed about said body and a secondary induction coil disposed about said bottom portion.

21. The melting unit as recited in claim 19, wherein said heating system includes an induction skull melting system.

22. The melting unit as recited in claim 19, wherein said opening extends through a bottom-most surface of said bottom portion.