CLAIMS

1. Molten-salt bath for nitriding mechanical parts made of steel, essentially ~~constituted by~~consisting of (the contents are expressed by weight):

- 25% to 60% alkali metal chlorides,
- 10% to 40% alkali metal carbonates, and
- 20% to 50% alkali metal cyanates,
- a maximum of 3% cyanide ions,

the total of the contents being 100%.

2. Molten-salt bath according to claim 1, in which the alkali metal chlorides are lithium, sodium and/or potassium chlorides.

3. Molten-salt bath according to claim 1 or claim 2, in which the alkali metal chloride content is comprised between 40% and 50%.

4. Molten-salt bath according to claim 3, in which the alkali metal chloride content is at least approximately equal to 45%.

5. Molten-salt bath according to any one of claims 1 to 4, in which the alkali metal cyanate content is comprised between 20% and 40%.

6. Molten-salt bath according to claim 5, in which the alkali metal cyanate content is comprised between 25% and 30%.

7. Molten-salt bath according to any one of claims 1 to 6, in which the alkali metal carbonate content is comprised between 20% and 30%.

8. Molten-salt bath according to claim 7, in which the alkali metal carbonate content is comprised between 25% and 30%.

9. Molten-salt bath according to claim 1 or claim 2, essentially ~~constituted by~~ consisting of:

- 25% to 30% sodium cyanate,
- 25% to 30% sodium and lithium carbonates,
- 40% to 50% potassium chlorides,
- a maximum of 3% cyanide ions,

the sum of these contents being 100%.

10. Molten-salt bath according to claim 9, essentially ~~constituted~~ consisting of, before formation of cyanide ions up to a maximum of 3%, by:

- 28% sodium cyanate,

- 22% sodium carbonate,
- 5% lithium carbonate,
- 45% potassium chloride.

11. Process for nitriding mechanical parts made of iron or steel, according to which these parts are immersed in a bath of the abovementioned composition, at a temperature comprised between 530°C and 650°C for a maximum of 4 h.

12. Process according to claim 11, according to which the parts are immersed in the bath at a temperature comprised between 570°C and 590°C for a maximum of 2 h.

13. Mechanical part made of nitrided steel obtained by the process according to either one of claims 11 and 12, not exhibiting any trace of a subsequent mechanical finishing process such as grinding.