WISSEN RESEARCH
EMPOWERING INNOVATION

INVALIDATION

ACTIVE RECTIFIER

CASE STUDY

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INVALIDATION AND SEARCH STRATEGY

- **Purpose**: An invalidation search aims to find prior art or evidence that can challenge the validity of a granted (Both pre and post-grant) patent. This is typically done to prevent or counter legal enforcement of the patent.

- **Scope:** The search focused on identifying prior publications (Patent or NPL). That could invalidate claims of a subject patent.

- **Outcome:** If successful, the invalidation weakness or nullifies the enforceability of the patent.

- **Tools and Source:** It relies on an extensive examination of patent databases, academic publications, technical documentation, and even non-traditional sources such as public demonstrations.

PHASE 1

We received a request from a client to invalidate a patent that is related to a system described as an active rectifier. The active rectifier is an advanced circuit that converts alternating current (AC) to direct current (DC) using actively controlled switches, such as MOSFETs, instead of traditional diodes to improve efficiency.

In this design, the first and fourth switches operate during the negative AC voltage cycle, while the second and third switches operate during the positive cycle, directing current to a rectifying capacitor. A synchronization control unit compensates for comparator delay in detecting AC zero-crossing, ensuring precise switching. Additionally, level shifters adjust for threshold voltage, optimizing the operation of the third and fourth switches for accurate rectification.

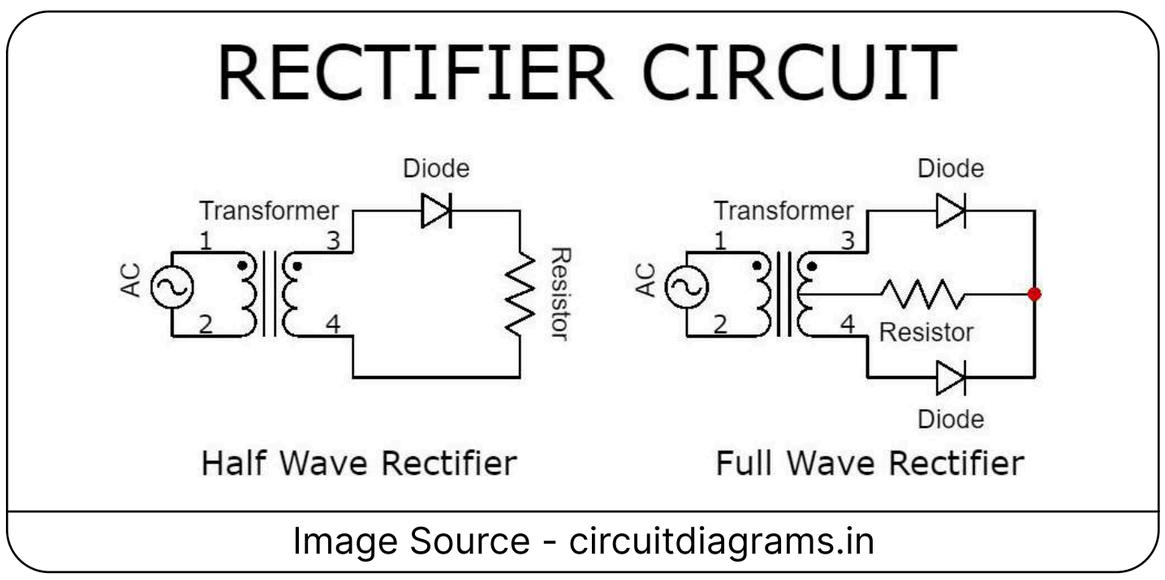
SEARCH SUMMARY

We thoroughly reviewed both the patent text & its prosecution history to understand its scope and claim in detail. Armed with this knowledge, we initiated an extensive search using both free and paid patent databases. To begin with, we crafted a search strategy based on synonyms for key terms highlighted in the claim, alongside using the assignee's name and relevant classification codes to refine the search.

We focused our search on patents related to the novel point describing the use of synchronization control and level shifters to compensate for comparator delay and threshold voltage, ensuring precise and efficient switching in an active rectifier for improved AC-to-DC conversion performance.

PHASE 2

Initially, our search focused on patents related to level shifters to compensate for comparator delay and threshold voltage. In this early phase of the search, we found several patents that were closely aligned with the claim in the patent we were analyzing. However, the process and elements defined were different. This was a crucial gap that needed to be explored in more detail.



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PHASE 3

To narrow down the search further, we refined our approach by targeting patents that specifically involved more precise design lies use of synchronization control and level shifters to compensate for comparator delay and threshold voltage, ensuring precise and efficient switching in an active rectifier for improved AC-to-DC conversion performance. By leveraging more specific synonyms and refining strategy. We could filter out unrelated results and pinpoint patents that were highly relevant to the claim.

In addition to the paid databases, we expanded our search by reviewing non-patent literature (NPLs), such as technical articles and research papers, often containing valuable insights into state-of-the-art technology that might not yet be patented. This broader approach helped me uncover additional relevant information that further strengthened our position.

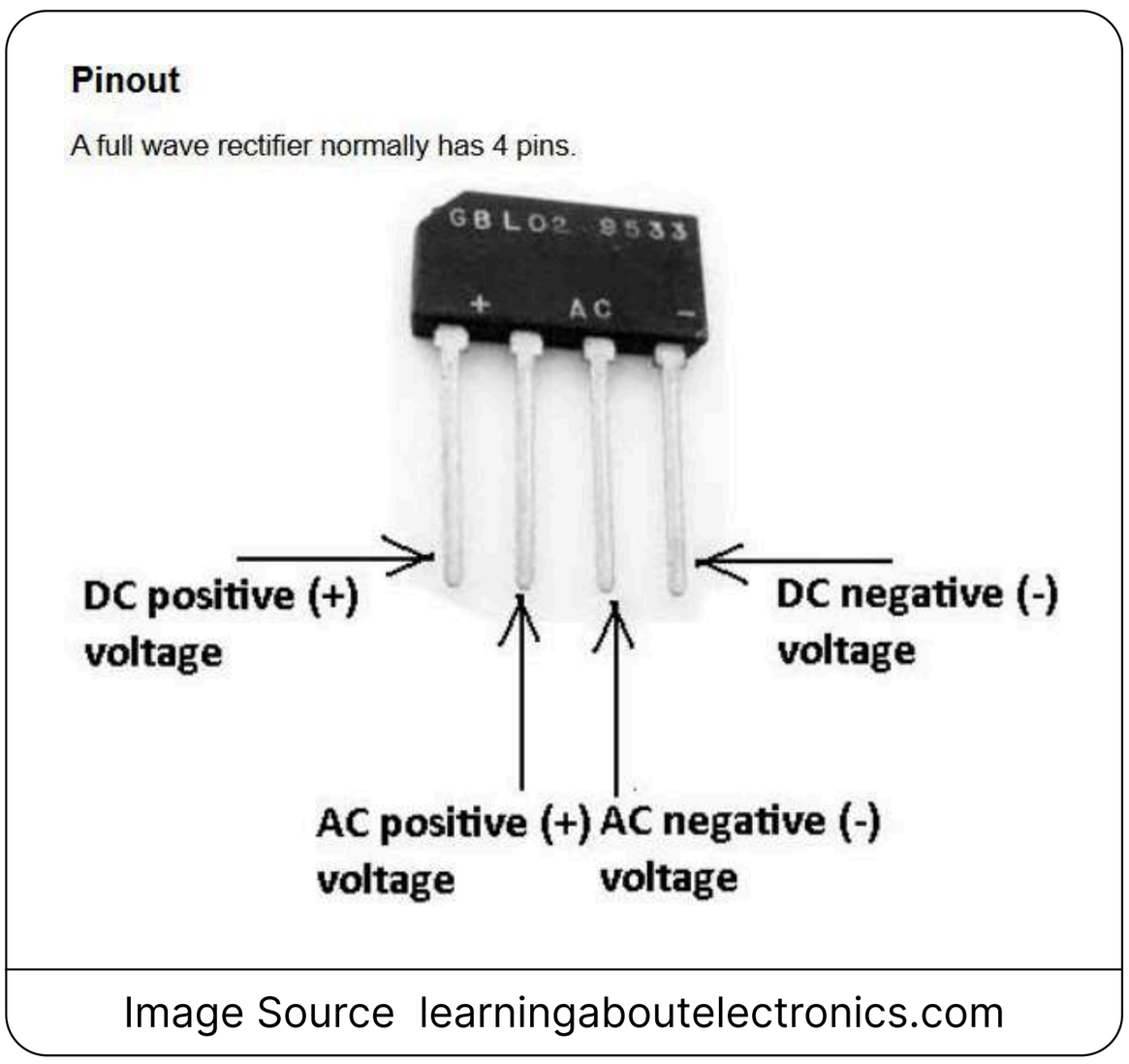
OVERALL SUMMARY

Ultimately, our invalidation search revealed that systems predating the patent already tackled similar challenges. One such system employed an active rectifier, a sophisticated AC-to-DC converter. Unlike traditional diode-based rectifiers, this design utilized actively controlled switches, like MOSFETs, boosting efficiency.

In this active rectifier, switches orchestrated current flow. The first and fourth switches activated during the negative AC cycle, while the second and third managed the positive cycle. These switches directed current to a rectifying capacitor. A synchronization control unit precisely timed the switching, compensating for delays in zero-crossing detection.

Level shifters adjusted voltage thresholds, ensuring optimal performance of the third and fourth switches. This prior art discovery proved critical. It demonstrated the patent's claimed invention lacked novelty.

We successfully challenged the patent's validity by showcasing existing systems addressing the same technical issues. The research strategy combined a comprehensive review of patent documents and non-patent literature (NPLs). This analysis confirmed the technology's prior existence, thus demonstrating the patent's claims were neither novel nor inventive. Therefore, the patent was invalidated.



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